THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXVII. No. 671.] LONDON, MARCH 21, 1876. [28TH YEAR.] Price 6d.

RAMSAY'S NEWCASTLE CANNEL COAL. Analysis—10,000 cubic feet of gas per ton of coal; 26-candle gas; 13¼ cwt. coke per ton of coal.
The London Exhibition in 1851 was lighted with gas made from Ramsay's Cannel.
RAMSAY'S PATENT CONDENSED GARESFIELD COKE.
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GAS-RETORTS, introduced 1838. FIRE-BRICK WORKS, established 1804. FIRE-CLAY SANITARY PIPES, CHIMNEY-TOPS, and all Goods made of Fire-Clay. The Fire-Clay is worked from Blaydon Main Colliery, is of excellent quality, and no expense spared in perfecting every article. The FIRE-BRICKS (marked "RAMSAY") are to be seen in all parts of the world, and the Works are the most extensive in the Kingdom.
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Address G. H. RAMSAY, NEWCASTLE-ON-TYNE.
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GENUINE TORBAY PAINT
AND
SPECIAL GASOMETER PAINT
(Mixed ready for use).
These Paints are now used in 100 Country Gas-Works, and by all (but one) of the London Gas Companies, on Gasholders, Scrubbers, Purifiers, &c. They will cover tar effectually. Also used by the Admiralty, War Office, Railway Companies, Founders, &c.
They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations.
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(SUCCESSORS TO SAMUEL CALLEY. ESTABLISHED 20 YEARS.)
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WORKS: BRIXHAM, TORBAY.

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BROOKFIELD IRON-WORKS,
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COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
BLAYDON BURN, BLAYDON-ON-TYNE,
Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS-RETORTS and OTHER OBJECTS in FIRE-CLAY," and they were also awarded at the INTERNATIONAL EXHIBITION of 1862, the PRIZE MEDAL for "GAS-RETORTS, FIRE-BRICKS, &c., for EXCELLENCE of QUALITY."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.
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THE WEDNESBURY TUBE-WORKS, WEDNESBURY;
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THE ALMA WORKS, WALSALL.
Established at the commencement of Gas Lighting.
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35, 36, 37, & 39, GRANBY ROW, MANCHESTER.
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J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water; Gun-Metal Cocks, Stocks, and Dies; Galvanized Tubes and High-Pressure Tubes, &c.
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OF
FIRST-CLASS MATERIALS & WORKMANSHIP;
Also, STATION-METERS, PRESSURE-GAUGES, STREET-LAMPS, REGULATORS, &c.
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MANUFACTURERS OF
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CAST & WROUGHT IRON TANKS FOR DITTO,
And Gas Apparatus of every Description.
Marine, Tubular, Cornish, Plain, Furnace, Saddle, and Range Boilers.
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Roofs, Girders, and Bridges, and General Smith's Work.
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RETORTS SET, AND GUARANTEED TO BURN OFF A CERTAIN AMOUNT OF COAL OR ELSE NO MONEY TAKEN FOR THE CONTRACT.
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Retort-Setters sent to all parts of Europe and America.
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DUKE OF HAMILTON'S
LESMAHAGOW
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LONDON, 1862. CLASS X.
LONDON, 1862. CLASS XXXI.
PARIS, 1867. SILVER MEDAL.
AMSTERDAM, 1869.
DIPLOMA D'EXCELLENCE.
MANCHESTER. VIENNA, 1873. THE ONLY MEDAL.
SILVER MEDAL 1875.

GEORGE GLOVER & CO.,
MANUFACTURERS OF
IMPROVED DRY GAS-METERS,
WARRANTED TO MEASURE CORRECTLY, AND NOT TO VARY.

EXTENSION OF PREMISES.

G. G. & Co. having had their premises entirely rebuilt, are now fairly in possession of large and commodious workshops, specially adapted to the requirements of the trade, and they are prepared to execute orders, large or small, with promptness and despatch.

THEY KEEP IN STOCK METERS OF ALL SIZES, UP TO 300 LIGHTS.

RANELAGH WORKS, RANELAGH ROAD, PIMLICO,
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G. G. & Co. have just been awarded a SILVER MEDAL for Gas-Meters and Gas Apparatus at the Exhibition of the "Society for the Promotion of Scientific Industry," Manchester.

SILVER MEDAL, PARIS EXHIBITION, 1867.

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WROUGHT-IRON TUBES AND FITTINGS

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LAP-WELDED IRON AND HOMOGENEOUS METAL BOILER TUBES.

Boiler-Tube Ferrules, Gun-Metal Gland Cocks, Water-Gauges, Whistles, &c.; Stocks, Taps, and Dies for Screwing, and Gas-Fitters Tools.

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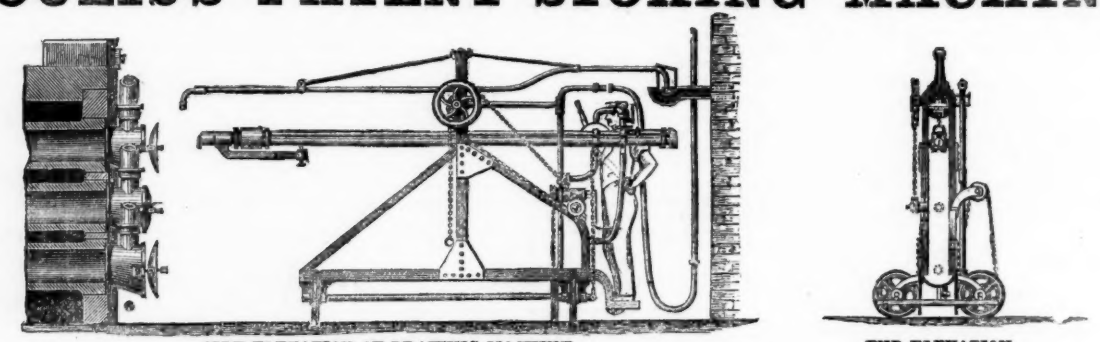
FOULIS'S PATENT STOKING MACHINE.



SIDE ELEVATION OF DRAWING MACHINE. END ELEVATION.

(The Charging Machine will be Illustrated in next week's Advertisement.)

Makers: TANGYE BROTHERS and HOLMAN, London and Birmingham; ADAM WOODWARD and SON, Manchester; ROBERT LAIDLAW and SON, Glasgow; MASCHINENBAU-ACTIEN-GESELLSCHAFT HUMBOLDT, Kalk bei Deutz; Or all particulars may be had from JAMES WOTHERSPOON, 31, St. Vincent Place, Glasgow.

WEST'S GAS IMPROVEMENT COMPANY,

LIMITED,

ARE NOW PREPARED TO SUPPLY AND ERECT THEIR PATENTED MACHINERY FOR

CHARGING AND DRAWING GAS-RETORTS,

And to enter into arrangements with GAS COMPANIES for its use upon moderate terms of Royalty.

The Patented Machinery has secured the approbation of all Engineers who have visited the MAIDSTONE GAS-WORKS, *where it is in full operation, and may be inspected at any time on application to the Manager.*

The advantages attending its use are—

INCREASED VOLUME OF GAS PER TON.—INCREASED YIELD PER RETORT.—INCREASED BULK OF COKE FOR SALE.—REDUCTION IN LABOUR AND LESS DEPENDENCE ON SKILLED STOKERS.

A Pamphlet containing a description of the Machinery, and Copies of Reports on the working of the same, &c., will be forwarded on application to the MANAGING DIRECTOR, Maidstone. Communications may also be addressed to the Consulting Engineer, R. P. SPICE, Esq., M. Inst. C.E., 21, Parliament Street, London, S.W., or to the Engineer and Analyst, F. W. HARTLEY, Esq., A. Inst. C.E., 55, Millbank Street, London, S.W.

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THE MEDAL FOR 1862.

The only Prize Medal awarded for TUBES & FITTINGS.

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ONLY MAKERS OF HOMOGENEOUS METAL TUBES.

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HYDRAULIC TUBES, BEDSTEAD TUBES, WELL TUBES, TELEGRAPH POSTS, COILS, &c.;

GAS-FITTERS TOOLS, VALVES, COCKS, &c.

THOMAS PIGGOTT & CO.,

(Established 1822,)

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PURIFIERS, CONDENSERS, SCRUBBERS, RETORTS, VALVES;

IMPROVED WROUGHT-IRON RETORT-LIDS, CROSS-BARS, & SCREWS;

AND GAS APPARATUS OF EVERY DESCRIPTION.

SOLE MANUFACTURERS OF LIVESEY'S PATENT GASHOLDER MAN-LID,

By use of which Man-lid, inlet and outlet pipes can be examined and cleansed without loss of gas in crown of holder, or ingress of atmospheric air.

ROOFS, GIRDERS, BRIDGES, AND BOILERS OF ALL KINDS.

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&c., &c.

STREET-LAMP METERS in CAST-IRON CASES.

LAMP COCKS AND BRASS FINISHING IN ALL ITS BRANCHES.

JOHN WRIGHT AND CO., ESSEX WORKS, BIRMINGHAM,

Beg to call the attention of MANAGERS and DIRECTORS of GAS COMPANIES to the following letter which they have lately received.

COPY OF LETTER RECEIVED FROM MAGNUS OHREN, Esq.

To Messrs. John Wright and Co., Essex Works, Birmingham. *Crystal Palace District Gas Company, Lower Sydenham, S.E.*

Dear Sirs,—In reply to your inquiries, I am glad to state that the use of GAS COOKING AND HEATING STOVES has been a complete success here. We have several hundred in use in our districts. We also find it advantageous to let out Stoves at a small rental. We have now 275 Stoves at rent.

The Stoves you make I can with confidence recommend, having so many in use, and giving satisfaction. I need scarcely point out to you the advantage to Gas Companies to recommend the use of Gas Stoves to their Gas Consumers, even where they do not supply them on sale or rent, as the use of Gas Stoves brings day consumption, and thus the Company make a profit by day as well as by night.—I am, dear sirs, yours faithfully, MAGNUS OHREN.

Size, 25½ in. high; 14 in. wide; 12½ in. back to front.

Price 50s., complete with Pan and Gridiron.

GAS HEATING STOVES

(TERRA COTTA AND IRON).

THE CHEERFUL STOVE.

COOKING STOVES.

BREAKFAST COOKERS.

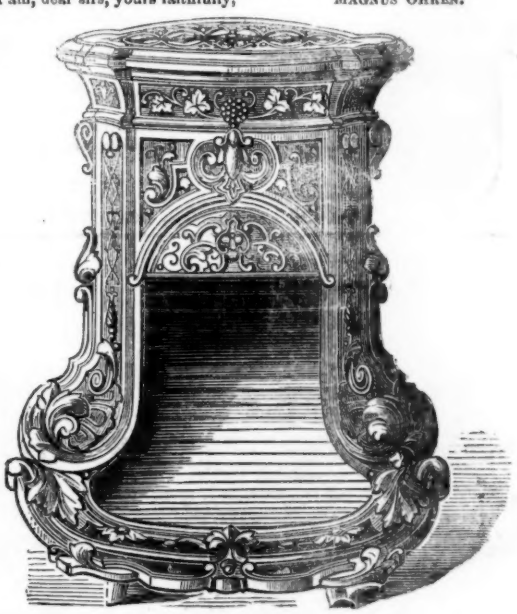
BATHS HEATED by GAS

GAS STOVES

For Boiling, Broiling, Preserving, Heating Flat Irons, and for all other Domestic Purposes.

Gas Companies and the Trade who have not our Illustrated Catalogue are respectfully requested to apply for same.

A LIBERAL DISCOUNT to the TRADE.



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THE CHEERFUL GAS STOVE, with Copper Reflector, Has all the appearance of a Bright Fire.

PRICE from 32s.

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IMPERIAL METER COMPANY,

LIMITED,

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MANUFACTURERS OF

"WET" & "DRY" GAS-METERS IN IRON & TIN-PLATE CASES,

STATION-METERS AND GOVERNORS, STREET-LAMP METERS, BOXES, AND REGULATORS FOR THE AVERAGE METER SYSTEM.

TO GAS COMPANIES, ENGINEERS, &c.

These Works are in full operation, and it will be the aim of the New Company not only to keep up the excellent workmanship of their predecessors, but, by the introduction of special machinery, to manufacture **Meters of a higher standard than is usually given, without increasing the cost.**

Special attention is invited to the Compensating Wet Gas-Meter of De Castro and Burton, which is now becoming so generally adopted, and is more simple in construction than any other Compensating or Ordinary Wet Meter. There is but one centre of friction to be overcome by the gas. By its self-adjusting principle it maintains an unvarying water-line; and the reservoir contains sufficient water to supply the Meter for twelve months without attention. It is unaffected by "tilting," and cannot be "flooded" by any pressure.

The Company also manufacture Dry Meters upon the most improved principle, and all their Meters being made to standard gauges, the most accurate measurement is obtained.

Attention is also called to their Dry Meters in Wood Cases, as used by some of the London Gas Companies. These Cases are a great preservation to Tin-plate Meters, especially in seaport towns, where the air is impregnated with salt; they are also particularly suited for export.

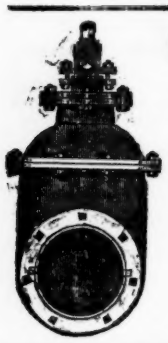
The Company repair or convert every description of Wet Gas-Meters to De Castro and Burton's Patent.

JOSEPH AIRD,

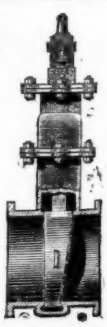
WELLINGTON TUBE-WORKS, TIPTON, STAFFORDSHIRE,

MANUFACTURER OF

EVERY DESCRIPTION OF TUBING, GAS, STEAM, HYDRAULIC TUBES AND FITTINGS,
EITHER BLACK, GALVANIZED, OR ENAMELLED HOT WATER TUBES AND FITTINGS,
CORE BARS, COILS, COCKS (IRON OR BRASS),
CHANDELIERS, &c., GAS-FITTERS' TOOLS, GAS TONGS, STOCKS, TAPS, DIES, &c., &c.,
HANDRAIL TUBINGS, IRON AND BRASS, PLAIN OR TWISTED,
TELEGRAPH TUBES OR POLES, &c., &c.



C. & W. WALKERS' DOUBLE-FACED GAS-VALVES.



These solidly constructed double-faced Gas-Valves have taken the place of the old system of the light, single-faced disc, which is too uncertain and unreliable in large bores.

They are guaranteed absolutely gas-tight. They are very massive and rigid, and by improved modes of manufacture they are produced at very little excess in cost over the old light, weak system, which is liable to spring and bend, and become leaky.

The Valve is a rigid wedge of solid cast iron, having two perfectly scraped surfaced facings fitting between the two on the body, which are also surfaced.

A spring in two short halves, and, therefore, not liable to break, is used only for scraping the front facing clean.

The front facing is vertical; the back facing forms the wedge.

At a slight additional expense both flanges are faced to bolt to main-pipes.

MIDLAND IRON-WORKS,

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THE ORIGINAL

WORTLEY FIRE-BRICK WORKS,

NEAR LEEDS,

MANUFACTURERS OF ALL DESCRIPTIONS OF

FIRE GOODS, and Salt-Glazed Drain-Pipes.

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Wharf No. 4, inside Great Northern Goods Station, King's Cross, N.;

LIVERPOOL—1, Back Leeds Street,

Where is always kept a Stock of Retorts, Fire-Bricks, Terra Cotta Ware, and Drain-Pipes.

WILLIAM SUGG,

GAS ENGINEER,

VINCENT WORKS, VINCENT STREET,

WESTMINSTER, S.W.

WILLIAM SUGG'S LATEST IMPROVEMENTS IN GAS-BURNERS.

The "LONDON" ARGAND BURNER, with SELF-ACTING GOVERNOR (Patent).

"Westminster" Pattern Shade, as used in the Ministers Rooms and Lobbies of the Houses of Parliament. This Burner is No. D size, and, with a consumption of 5 cubic feet per hour, gives about 2 candles more light than the Gas Referees model, called the No. 1 "London" Argand Burner.

With 5 cubic feet per hour of gas, which gives a light equal to 14·3 parliamentary sperm candles (as tested by the Sugg-Letheby Standard Burner), the ordinary Argands give only a light equal to 10 sperm candles, while the No. F Patent "London" Argand Burner gives a light equal to 18½ sperm candles, or 85 per cent. more light for the same quantity of gas consumed.]

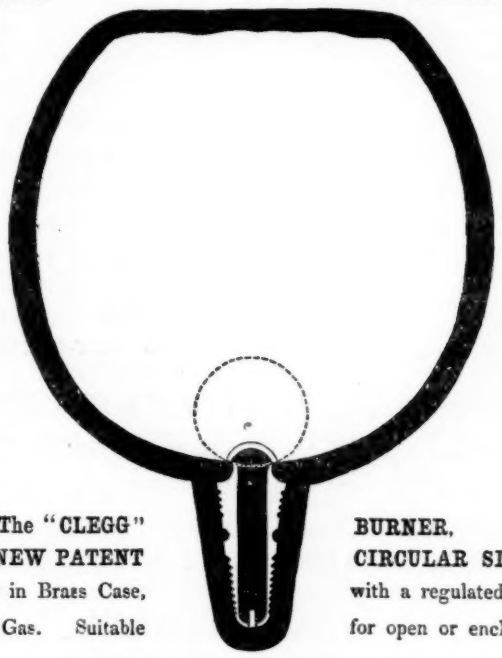
The "CHRISTIANIA" FLAT-FLAME BURNER, with SELF-ACTING GOVERNOR (Patent).

This Burner has been pronounced by the most eminent Engineers of the day to be the perfection of a flat-flame Burner.

The Shades, which are made in a beautiful white glass called Albatrine, are manufactured *exclusively* for these Burners, and cannot be obtained elsewhere.

The light emitted from this Burner is very white and soft to the eyes, and is about 30 PER CENT. superior to the ordinary fishtail.

Numerous other pattern Shades, Plain or Ornamental, may be obtained with these Burners.



The "CLEGG" BURNER, with the NEW PATENT CIRCULAR SLIT.

Is a flat-flame Burner in Brass Case, with a regulated opening for the admission of Gas. Suitable for open or enclosed Lights.

Price Lists and Prospectuses, with description of all the "London" Argand and other Burners, and their proper Shades, Supports. &c., forwarded post free on application.

WATER-MAINS.

COTTERILL'S PATENT STEEL TUBE-DRILLS, for connecting services to water-mains, *under pressure*, without turning off the water. They drill and tap themselves, and are left in the mains. Made of all sizes, from ½ to 2 inches and upwards. They cost less than the ordinary plan.

Apply to CHARLES FORSTER COTTERILL, Cannock, STAFFORD, Patentee.

JAMES OAKES & CO.,

ALFRETON IRON-WORKS, DERBYSHIRE,

AND

WENLOCK IRON WHARF, 21 & 22, WHARF ROAD, CITY ROAD, LONDON, N.,

Keep in London and at their works large stocks of PIPES and CONNEXIONS (1½ to 36 inches in diameter); also make and supply Retorts, Tanks, Columns, Girders, Special Castings required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.

CHARLES HORSLEY, Agent.

INTERNATIONAL EXHIBITION, 1862.

CLASS X.

PRIZE MEDAL

For excellence of Fire-Clay Gas Retorts, and "HONOURABLE MENTION" for good quality of Fire-Bricks.

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THROCKLEY,

NEWCASTLE-ON-TYNE.

B. CARPENTER,

(ESTABLISHED MORE THAN 15 YEARS,)

THE ORIGINAL MANUFACTURER OF

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FOR

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GAS AND WATER PIPES.

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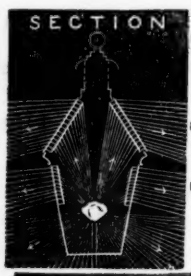
18 & 20, ALSTON STREET, GLASGOW.

CAST-IRON GAS AND WATER PIPES.

DELIVERY F.O.B. ON CLYDE, OR STOCKTON-ON-TEES.

Prices on application.



THE PATENT

CATOPTRIC LAMP

Is now in use in Moorgate Street, Cheapside, and Trafalgar Square, and has been in successful operation upon Waterloo Bridge since Oct. 7, 1871.

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Gas-Meter, Gas Apparatus, and Gas-Fittings Manufacturers,

EDINBURGH, AND

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NEWGATE STREET, LONDON.

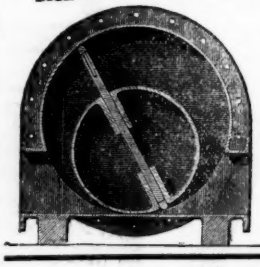
Meter Works in London—2, CROSS STREET, WILDERNESS ROW, E.C.

STATION-METERS, GOVERNORS, CONSUMERS METERS, GAS LUSTRES, CHANDELIERS, BRACKETS, &c.,

And every description of Gas-Fittings and Gas Apparatus.

TRADE MARK

J. BEALE'S PATENT GAS EXHAUSTER.



BEALE'S CONTINUOUSLY ACTING

GAS EXHAUSTERS

ARE NOW MANUFACTURED BY

B. DONKIN & CO.

MR. J. BEALE, of East Greenwich, having retired from business, has made an arrangement with B. DONKIN & CO. for the sole manufacture of his Patent Solid-Slide Gas Exhausters.

B. D. & Co. also make Steam-Engines to drive Gas Exhausters direct or otherwise, and Gas-Valves.

Estimates and Prices on application to

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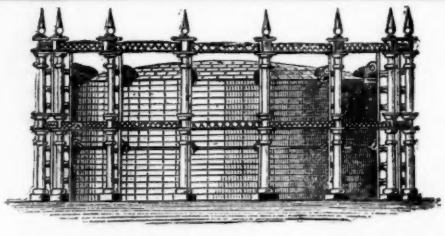
HOPE IRON WORKS,



STOCKTON ON TEES.

ASHMORE & WHILE,

GAS ENGINEERS & CONTRACTORS,

MANUFACTURERS OF GASHOLDERS,

GAS APPARATUS OF EVERY DESCRIPTION,

Including Improved

Retort-Lids, Boilers, Cast and Wrought Iron Tanks, Iron Roofing, Bridges, Girders,

And GENERAL IRONWORK.

N.B—Estimates for all Gas Plant and Remodelling supplied on application.

HODGE & CO.'S

IMPROVED VENTILATING SUN-LIGHTS

WITH TALC REFLECTORS AND SELF-ACTING VALVES TO PREVENT DOWN-DRAUGHT;

VENTILATING GLOBE LIGHTS for DINING-ROOMS, LIBRARIES, &c.

Ormolu, Bronze, & Crystal Gaseliers;

MEDIÆVAL CHURCH WORK AND CORONÆ

COCKS, VALVES, and FITTINGS for GAS, STEAM, and WATER;

COLUMNS, BRACKETS, & STREET LANTERNS;

BLACK AND GALVANIZED BARREL COMPO AND TIN PIPE.

GAS ENGINEERS,

100, HATTON GARDEN, LONDON.

Drawings and Prices upon application.

TANGYE BROTHERS AND HOLMAN,

LAURENCE POUNTNEY LANE, LONDON, E.C.,

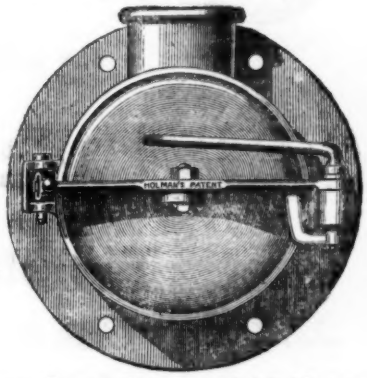
SOLE MAKERS OF

MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH

HOLMAN'S NEW PATENT BRACKETED CROSS-BARS,

Anti-Friction Catches and Eccentric Fastenings.



Instantaneous Sealing effected. No Luting. No Duplicate Lids required. Holman's New Self-Sustaining Cross-Bar ensures freedom of joint and maintains parallel position of the Lids.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested (rigid cast iron is now successfully employed), nearly 20,000 being in use at various Gas-Works in London and the Provinces, among which may be mentioned:—

The Gaslight Co., Beckton (where, by the end of 1875, nearly 4000 were in use).
" Gaslight Co., Bow Common.
" Gaslight Co., Silvertown.
" Gaslight Co., Lupus Street.
" London Gaslight Co.
" Independent do.
" Phœnix do.
" South Metropolitan Gaslight Co.
" Commercial do.
" Imperial do.
" West Ham Gas Co.
" Gas-Works, Barnet.

The Gas-Works, Royal Arsenal, Woolwich.
" do. Lower Sydenham.
" do. Brentford.
" Consumers Gas Co., Woolwich.
" Alliance and Dublin Gas-Works.
" Edinburgh do.
" Manchester Corporation do.
" Salford do. do.
" Rochdale do. do.
" Liverpool Gas-Works.
" Birmingham do.
" Birkenhead do.
" Nottingham do.

The Newcastle-on-Tyne Gas-Works.
" Lurgan do.
" Carmarthen Gas-Works.
" Merthyr Tydfil do.
" Windsor do.
" Leeds do.
" St. Albans do.
" Over Darwen do.
" Rotherham do.
" Aylesbury do.
" Bournemouth do.
" Ystrad do.
" Cardiff do.
" Rochester do.

The Keighley Gas-Works.
" Aberdare do.
" Ballymena do.
" Richmond do.
" Stalybridge do.
" Longton do.
" Exeter do.
" Ross do.
" Falmouth do.
" Barrow-in-Furness do.
" Belfast do.
" Wakefield do.
And other Provincial and Foreign Gas-Works.

IMPORTANT TESTIMONIAL.

The Gaslight and Coke Company (Commonly called the Chartered Gas Company), Beckton, North Woolwich, July 2, 1874.

MESSRS. TANGYE BROTHERS AND HOLMAN.

Gentlemen,—In answer to your inquiry respecting the Self-Sealing Lids, I beg to say that they continue to work well, and I have every reason to be satisfied with them.

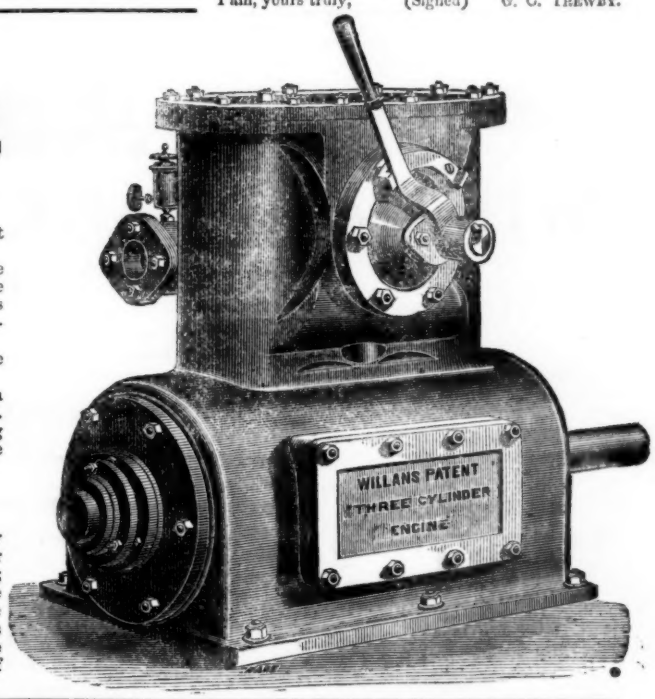
I should be very sorry to return to the old system of Luting, and our stokers here freely acknowledge the benefit to them of the new system.

I am, yours truly, (Signed) G. C. TREWBY.

WILLAN'S PATENT THREE-CYLINDER ENGINE,

ESPECIALLY SUITED TO DRIVE

GAS-EXHAUSTERS.



This Engine is exceedingly simple in construction, unlikely to get out of order, and can be safely driven by the most unskilful.

No fly-wheel is necessary, there being no "dead centre." The connecting-rods being always in compression, there is no blow on the crank-pin at either end of the stroke, and consequently the Engine is free from the knocking which is nearly always present where double-acting cylinders are used.

All the working parts, being contained in the cylinder casing, are thoroughly protected from injury by dust, &c.

The Engine occupies very much less space than is taken up by an ordinary engine doing equal work; it is also of considerably less weight.

The foundations required for it are of the simplest kind. Driving gear can be attached to either end of the crank-shaft, so that the Engine may at will be made either right or left hand.

From the "Engineer," Oct. 1, 1875.

"Although the engine is only single acting, it will do considerably more work than an ordinary double-acting engine of the same cylinder capacity. There is no thump, no matter how loose the bearings are; indeed, the whole of the bearings may be quite worn out before the working of the engine is affected. It is perfectly noiseless, and the speed at which it can be driven is very great. The working parts can be examined at a moment's notice, by removing the door at the side of the casing. These parts are very few in number, and are of the simplest description."

INDICATED HORSE POWER—At a mean steam pressure of 30 lb. per square inch.	3 H.P.	7 H.P.	15 H.P.	19 H.P.	31 H.P.	53 H.P.
Diameter of Cylinder . . . . . inches.	3	4	6	7	8	10
Length from end to end of shaft-bearings . . . . . "	18	25	36	47	49	60
Breadth . . . . . "	12	15	20	22	27	34
Height . . . . . "	19	20	29	40	42	56
Weight of Engine complete. . . . . cwt.	2¼	3½	8	9	16¼	31
Diameter of steam-pipe . . . . . inches.	¾	1	1¼	1¾	2	2¾
Price complete, with Reversing Gear	**£25**	**£35**	**£55**	**£80**	**£110**	**£180**
If fitted with Tangye's Patent Governor . . . . . EXTRA.	**£6**	**£7 10**	**£9 10**	**£10**	**£12 10**	**£14 10**

London 1851.

New York, 1853

Paris, 1855.

London, 1862.

Dublin, 1865

The SIX MEDALS AWARDED to THOMAS GLOVER for

PATENT DRY GAS-METERS,

The latter being the Highest Medal awarded for Dry Gas-Meters by the Imperial Commissioners for the Universal Exhibition, Paris, 1867.

Paris, 1867.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

LONDON, E.C.

THOMAS GLOVER & CO.'S PATENT DRY GAS-METERS,

1st, Are a remedy for all the defects of Wet Meters;
2nd, Are suitable for all climates, whether hot or cold;
3rd, Incur no loss of Gas by evaporation;
4th, Cannot become fixed by frost, however severe;
5th, Are the most accurate and unvarying measurers of Gas;
6th, Prevent jumping or unexpected extinction of the Lights;
7th, May be fixed either above or below the level of the Lights;
8th, Cannot be tampered with, without visibly damaging the outer case;
9th, Will last much longer than Wet Meters;
10th, Will not cost more than one-half for repair that Wet or Water Meters do;
Are upheld for five years without charge.

WILLIAM PARKINSON & CO.,

(SUCCESSORS TO SAMUEL CROSLEY,)

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

MANUFACTURERS OF PATENT

WET & DRY GAS-METERS,

STATION-METERS WITH PLANED JOINTS,

GOVERNORS, PRESSURE REGISTERS, GAUGES,

AND EXPERIMENTAL APPARATUS,

STREET-LAMP METERS,

AND REGULATORS FOR AVERAGE METER INDICATION.

METERS FOR MEASURING WATER.

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TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, MARCH 21, 1876.

Circular to Gas Companies.

THERE has been, we believe, a slight obstacle in the way of the confirmation of the scheme for the amalgamation of the Chartered, Imperial, and Independent Gas Companies, in the shape of a disagreement with the metropolitan authorities as to their representation at the audit of the united company's accounts. These will, of course, be audited by the official appointed by the Board of Trade, and his certificate must be accepted as a proof that the statement of accounts, presented by the company, is correct. To propose an additional audit, would be to cast a reflection on the character of the official auditor, which he would, doubtless, resent. It may, however, be supposed, that the object of the authorities is not so much to dispute the accuracy of the several items in the accounts, as to call in question the propriety of the expenditure. Thus they might seek to show, that too much had been spent for coals and on purification. They might also endeavour to prove, that too little had been received for gas and residuals; and thus, every half year, the company might be subjected to something like a revision inquiry, which would prove an intolerable nuisance. The directors must be allowed to conduct their business in their own way, which must be accepted as the best way. Perhaps before these lines reach the reader's eye, this little dispute will have been arranged, and nothing more will remain to delay the confirmation of the scheme by the Privy Council.

The Bill of the Chartered Company, "as amended on behalf "of the Corporation of London and the Metropolitan Board of "Works," has been printed. Although this particular Bill concerns only the Chartered Company, some of the provisions inserted by the local authorities will, as a matter of course, be imported into the Regulations Bill, and thus they become of importance to all the Metropolitan Gas Companies. Passing over, for the moment, those which strictly relate to the Chartered Company, we may notice some proposals which it may be sought to make generally applicable, and at the same time point out the objections that are raised by the Chartered Company, in the general interest, we may say, of all the Metropolitan Gas Companies.

We may notice, first, the auction clauses, which have hitherto been of the simplest description. It has only been enacted, that the sales of shares shall be duly advertised for a certain period; but our authorities require that notice of the sales shall be posted in Guildhall, and at the office of the Metropolitan Board of Works. This provision can only be dictated by vanity and a sense of triumph. No one, who can stay away, ever goes to the office of the Metropolitan Board; and it is not to be expected that the country people who go to stare at Gog and Magog, or the "decayed liverymen" who, having nothing else to do, haunt the precincts of Guildhall, and vote, as occasion offers, for the maintenance of City privileges, will ever buy a gas share. Further than this, the "amended" Bill requires that if shares be offered by tender, notice of the reserved price shall be sent in a sealed letter to the Lord Mayor and the Chairman of the Metropolitan Board, to be opened on the last day for the reception of tenders. The insinuation conveyed in this latter requirement will be duly resented by the companies.

We have before alluded to the section in the Regulations Bill, which will allow the formation of an insurance-fund out of an excess of profits, for the satisfaction of any extraordinary expenditure, which, in the opinion of the official auditor, "due care and manage-"ment" could not have prevented. The Chartered Company are seeking in their Bill to make this fund applicable for the payment of the charges and expenses incident to strikes among the workmen. We do not expect to see another strike among gas stokers for several years to come, but if one should take place, a curious question, as to the exercise of due care and management, might arise. In our opinion, any expenditure incurred on account of a strike, might fairly be taken from the insurance-fund, as the clause is printed. It may be as well, however, to have the question settled beyond a doubt; and, therefore, the Chartered Company are right in introducing an explicit statement. As all the other companies are liable to strikes, they must be careful to see that a similar provision is introduced into the Regulations Bill.

Passing over some other matters which only concern the Chartered Company, we come to others in which, again, all the companies are interested. For example, the Regulations Bill proposes, in the event of defective illuminating power, a certain fine, according to the amount of gas *made* at the defaulting station on the day of default. It is very properly contended, on behalf of the company, that the fine should be calculated, not according to the quantity of gas *made*, but on the quantity *delivered* from the works. This difference is of much importance. The gas in stock may be of a very different quality to that reported on by the Examiner; but, as the Regulations Bill stands, a company may be fined for some million feet of gas, which is really above the standard illuminating power.

Then, again, as regards the forfeiture for excess of impurities. The Regulations Bill would inflict a fine for any excess, fixed on an average of three days. We agree with Mr. George Livesey, that the average of six days should be taken, to indicate the amount of impurity; but the Chartered Company seem to have accepted the average of three days. This, however, will leave the company exposed to hardship. The gas, for some reason at present inexplicable, may have a large excess of sulphur on one day, but, on the two next days, may be considerably below the limit, the average, however, showing a slight excess. As the Bill stands, the company will be liable to a fine for all three days, although, on two of them, the amount of sulphur in the gas may have been under the prescribed limit. The longer period of six days would give the company the opportunity of diluting and working off the accidentally contaminated gas. Another thing must be remarked. The reports of the Gas Examiners reach the companies very irregularly, sometimes two or three days after

the testings have been made; and that is an additional reason why a longer period should be allowed, on which to fix the average of impurity.

We have referred, above, to the question of the interference of the local authorities with the audit of the accounts of the companies, and need not here add much on this part of the question. We feel satisfied that the Board of Trade will support one of their most respected officers, in resisting this proposed interference with the performance of his duties. As for the gas companies, they, if the clause should be carried, may just as well ask the Corporation and the Board of Works to manage their undertakings for them. So long as the companies exist, they must be allowed to manage their own affairs. When the companies disappear, the Corporation and the Board of Works may do as they like.

The Bill to amend the Borough Funds Act is a very short one, consisting of but one clause. That clause is (as we speculated last week would be the case) to repeal section four of the Borough Funds Act, which requires the consent of ratepayers and owners to the expenditure of public money, in promoting or opposing Bills in Parliament. We have nothing to add to the remarks we have already made. Gas and Water Companies should exert their utmost endeavours in opposing this Bill, which is fraught with peril to them. If Corporations desire to become possessed of gas and water undertakings, they can always acquire them on fair terms; but the object of this Bill is simply to obtain the means of harassing companies, and, whenever possible, confiscating their undertakings.

The Burghs and Populous Places (Scotland) Gas Supply Bill has been referred to a Select Committee, and we shall hereafter have some evidence to report, but probably not much. From the fact that no Scottish gas company have petitioned against the Bill, we gather that they do not consider it inimical to their interests. It may be that there is a general desire, on the part of those companies, to dispose of their undertakings. If so, well and good. But it is distinctly intimated to us by Mr. Cecil Raikes, that what is good for Scotland may be good for Ireland and England also. Now, for our parts, we must protest against the enactment of any general law, which, in England, will allow local authorities to purchase gas undertakings, or, if a company refuse to sell, enable them to set up competing works, with the sanction of a Chairman of Quarter Sessions. The Scottish gas companies, as we have said, "make no sign," and it is curious to see that all the opposition to the Bill comes from the Corporation of Glasgow. Now, the Corporation of Glasgow, in relation to gas supply, are very much in the position of the Corporation of Birmingham. They supply wholly, or in part, a number of neighbouring burghs, which, if this Bill should pass, may compel the sale of portions of the Glasgow undertaking, and thus reduce the profits of the Corporation. We may leave them to fight their own battle, with the remark, that "what is sauce for the "goose is sauce for the gander." If it be just to confiscate the undertaking of a gas company, no injustice is done when the undertaking of a Corporation is confiscated.

Sir W. Anstruther imagined that what was proposed in the Bill we notice, was just that which has been enacted in the Public Health Act; but there is, we think, an essential difference. In neither case can a local authority supplant a *statutory* gas company; but, supposing that, in England, a local authority desired to enter into competition with a non-statutory company, who refused to be bought up, the authority would have to ask the consent of the Local Government Board, for authority to borrow the money necessary for the enterprise. As we understand Sir W. Anstruther's Bill, a certificate from the Sheriff would be sufficient authorization for the Commissioners of a burgh to borrow money, without the sanction of a central authority. If we are right in this opinion, we are bound to say that the Bill is as inimical to the interests of ratepayers as of gas companies.

Sir George Balfour has given notice of several amendments, which, if carried, will remove some of the obnoxious features of the Bill. In place of leaving companies to the mercies of arbitrators, he proposes that the shareholders of the companies purchased, shall be compensated by receiving the market value of their shares, fixed upon the average value in the five years preceding the offer of purchase, or annuities of equal value. This may not, perhaps, be just in all cases; but it might be accepted. Sir George further proposes, that, in all cases, the Commissioners who purchase shall accept the mortgage and bonded debts of the companies, as they stand in the books, and take the stores in hand at a valuation. If the Scottish gas companies choose to be bought up on such terms, we have nothing to object. South of the Tweed, we have the strongest objection to part with our property on compulsion, and have a firm belief that the public are as well served by companies as by local authorities. We must, however, in strict justice, say a word in favour of this Bill, inasmuch as it seeks to make general the plan of management which, for the most part, obtains in Scotland. The Bill provides that the self-supporting system, as we have called it, shall be adopted in all cases which come under its provisions. There is in Scotland (except in one or two cases) no extra taxation of gas consumers for what are called public improvements—a town-hall, for example, which will cost a million. The consumer is made to pay for his gas, and nothing more, in accordance with the soundest principles of political economy, as developed by John Stuart Mill. We should have much less objection to the transfer of gas undertakings to local authorities here in the South, if the Scottish system of management was adopted, and acted upon.

The Isle of Thanet Gas Company, and the Ramsgate Water Company, have scored the first victory in this session. To say the truth, a weaker case was never put before a Select Committee, than that offered by the Ramsgate Local Board. It required all the *bounce* Sir E. Beckett knows so well how to employ, and some misrepresentation—in which he, at times, no doubt quite inadvertently, indulges—to make the case at all presentable. But it completely broke down, as soon as the evidence was sifted. Under the skilful and pointed cross-examination of Mr. Pope and Mr. Michael, the case utterly collapsed, and the crushing speech of Mr. Pope was hardly necessary to complete a defeat which, it must have been seen, was inevitable. The moral remains to be noticed. The companies are now required to place themselves under what we may call modern legislation. They should have done so years ago; but it is perfectly certain that gas consumers (we here refer to the gas question only) have not suffered in consequence of the non-application of the general Acts. On the contrary, it was clearly proved that they have considerably gained. The fact is that—as Mr. George Livesey happily phrased it—the company have been doing the right thing in the wrong way. The extensions and additions to works made out of profits have kept down the capital account, while dividends have only been paid on capital expended. In this way there can be no doubt that the consumer has gained. The company must, however, now go to Parliament. They will enter upon what we may call a new lease. They will get their expended profits capitalized, and be granted a five per cent. dividend in respect of them; and, conscientiously fulfilling the obligations imposed by modern legislation, they may go on for years to come, safe from the attacks of rapacious Local Boards, and protected from the designs of filibustering "Consumers Companies."

The Vestry of St. George, Hanover Square, are considering the propriety of adopting the average meter system in the supply of their lamps. No objection is made on the part of the Chartered Company, who have, indeed, already applied to the Referees "to fix and certify the mode of ascertaining the quantity of gas "consumed." It thus seems likely that another important parish will be brought under the system, which we hope, in time, to see adopted all over the Metropolis.

The Lichfield Gas Company have sent a sort of *ultimatum* to the Town Council. They will take £18,000 for their undertaking, and sell the stock at a valuation, if the Council will complete the purchase on or before July 1st next, and pay all the costs of the transfer. We gather that not much objection is made to the price, but some in the Council strongly oppose the payment of the costs. Their town-clerk ought to know that it is the universal practice in all such cases for the purchaser to pay the costs of the transfer. In this particular instance they cannot be heavy, and the Council had better close the bargain at once.

The Town Council of Southampton may be characterized as an eminently modest body. This is strongly illustrated in their dealings with the gas company. They have obtained the consent of the ratepayers for the expenditure of money in opposing the company's Bill, and they have presented a lengthy petition against it. But they are evidently doubtful of the results of the opposition, and are trying to bully the company into coming to terms, which will save their pockets. We have before noticed their suggestion, that the company shall keep separate capital accounts for the borough and outlying districts, so that the former may be only charged with interest on capital employed within the limits. We believe that there is no precedent for any such arrangement, and we do not believe that any Parliamentary Committee is likely to set one. The Council further seek to reduce the price of gas, at once, to 4s. per 1000 feet, and would allow of no increase, unless justified by an advance in the cost of coal and freight, in which case they—the Corporation—will fix the price of gas. This last proposal surpasses in audacity anything we remember. It seems clear, that no compromise can be arrived at in Southampton. When the Bill gets before committee, the Town Council may become more reasonable. To our minds, there is nothing in the Bill to which serious objection can be taken; but we have no doubt that the company would make some concessions, if the Council would meet them in a fair and proper spirit.

We understand that the negotiations for the transfer of the Warrington gas undertaking to the Corporation of the borough have progressed so far, that the latter have made a definite offer to purchase, on conditions, which, it is believed, will be accepted by the company.

The Walsall Gas Purchase Bill has passed the Select Committee; and the Corporation of Birmingham have withdrawn their opposition to the other Local Board Purchase Bills, with the understanding, we are told, that the opposition may be renewed in the Lords, if satisfactory arrangements are not made in the meantime.

The Town Council of Birmingham are now having the first taste of the sweets of the gas purchase. In the estimate for the current year, just presented to the Council by the Gas Committee, it is proposed to transfer gas profits to the amount of £25,000 to the improvement-fund. This is so far satisfactory; the more so, because the Mayor states that £30,000 is to be applied in relief of the gas consumers. We hope, however, the time will come when the consumers will assert their right to the whole of the surplus profits. The Mayor anticipates, in the future, much larger gains than he had previously estimated. He states that the companies made bad contracts for the sale of residuals, and intimates that if these could be terminated at once, the Corporation might obtain £30,000 or £40,000 a year more than they get from this source. Perhaps, when the time comes to make fresh contracts, the Mayor may find himself to some extent mistaken. These are halcyon days for the Corporation; but, as Alderman Avery reminded the Council, the gas companies had, two years ago, to pay their dividends mostly from their reserve-funds, and the Council must not calculate too surely on the continued prosperity of their gas undertaking.

We have had brought under our notice a very remarkable mineral, which, we are told, is found in great abundance near Sydney, New South Wales. It was mentioned under the name of "Hartley Mineral," in the lecture by Professor Chandler, which we published in our issue for Jan. 11 last (p. 57). The results obtained by Professor Chandler, show that this mineral far surpasses Boghead cannel as a gas-producer; but we are told that much higher results than those recorded, have been obtained in Australia. It is far too rich a material to be used alone in the production of gas; but as an "Enricher," it would have the highest value. If, as we are informed is the fact, the mineral can be brought to this country and sold for eighty shillings per ton—and, if a large demand should spring up, for as little as sixty-five or seventy shillings—it certainly deserves the attention of gas companies. An endeavour has been made, we understand, to induce some of the Metropolitan Companies to unite in the importation of a trial cargo. In view of the rapid exhaustion of our own rich cannel-fields, this mineral, if it can be imported at the prices stated, may have an important influence on our industry.

That enterprising publisher, Mr. E. Stanford, has in course of publication, a series of small volumes, treating of "British "Manufacturing Industries." They are not designed as guides in the conduct of such industries, but are intended to give an intelligent reader such an insight into the processes, as all well-informed men are now-a-days expected to possess. The volume before us contains descriptions of the methods of producing Acids, Alkalies, Ammonia, and Soap, written by Professor Church; an article on "Oils and Candles," by Mr. W. Matthieu Williams; and another, on "Gas and Lighting," by Mr. R. H. Patterson. All these articles may be highly commended; but it is to the last that we may be expected to direct most attention. Every one conversant with the subject will admit that it would be impossible to give, in popular language, any useful description of the manufacture of coal gas. Mr. Patterson, we believe, has done the best that could possibly be done in this direction; and if a reader fail to gain much useful information on the subject treated of, it cannot be set down as the fault of the writer. In the latter portion of the essay, however, there is useful information, which any thinking gas consumer will appreciate. It deals with burners, and the most economical means of consuming gas. On this part of the question Mr. Patterson speaks with authority, and we hope the volume we notice will have a large circulation.

Water and Sanitary Notes.

That veteran sanitarian, Mr. Edwin Chadwick, C.B., has come out once more in the character of a water reformer. It has been said of some men, that they can forget nothing and learn nothing; and we need hardly say that Mr. Edwin Chadwick is Mr. Edwin Chadwick still. Of course, anything in the shape of a commercial company is a sore in Mr. Chadwick's eyes. Everything should be done for us by paid Commissions, under Government superintendence. We should all be Government *employés*, and, in time, be pensioned. That a man should earn money as a director of a company in which he has invested the greater part of his fortune, or by the exercise of a liberal profession, Mr. Chadwick evidently considers disgraceful. What is his great complaint to-day? In London, he says that about a hundred persons are annually killed, and a thousand maimed, all for the want of street hydrants, which, he avers, cannot be had while water companies exist! We concede the value of hydrants, but we doubt whether, if they were as frequent as lamp-posts, they would prevent stupid and impatient people from rushing across streets crowded with vehicles, and getting knocked over by a passing cab. But all these accidents—which a friend of ours, a great philosopher, considers the means used by Providence for the removal of stupid people—Mr. Chadwick ascribes to the failings of the water companies. It is impossible to argue with such a man. Whether there be a constant supply of water, or not—whether such supply be under the control of a paid Commission, or in the hands of some Municipal Authority—people will continue to be run over in the streets, and burned to death. As matters are, we contend that this Metropolis is as well and cheaply supplied with water as any place in the kingdom. Whenever the supply comes into the hands of an authority, whatever it may be, we shall be greatly mistaken if the public do not look back, with some regret, on the mild rule of the water companies.

We are glad to announce, that so much of the preamble of the Leicester Improvement Bill, as related to the purchase of the water company, was declared by the Select Committee unproved. The Corporation of Leicester can now devote their undivided energies to that much more important water question, which involves the prevention of the floods, that every now and then occasion so much discomfort and loss to their constituents.

We mentioned last week that the Bill promoted by the Southwark and Vauxhall Water Company had been withdrawn. The Richmond Vestry have since given notice of an application to Vice-Chancellor Malins, to compel the company to go on with their proceedings, or to have the Bill dismissed with costs. The hearing has been postponed until the next motion day; but, in the meantime, we should hope the company and the vestry will come to some agreement, on terms we suggested last week.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

LXXXVIII.

Considerations affecting the Establishment of Gas-Works.

From the preceding observations, it is evident that the capacity of the respective parts of a gas-work can only be decided upon after due consideration of all the various points referred to. Thus, for the proper supply of cities and towns, where the public lighting is continued nightly throughout the year, the gasholders or storeage for gas will be required of less capacity than where the lighting is irregular. In the Metropolis, the greatest number of retorts in use, and the storeage provided, are about equal to the demand for gas during the longest night and the shortest day in the depth of winter. But it sometimes happens, that the prevalence of foggy weather, for even a few hours only, taxes the resources of the works to the utmost. In most northern towns the heavy lighting is only of about three weeks duration during the year, and any expenditure of capital for gasholders required for so short a period is avoided. On the other hand, where the public lighting is irregular, and particularly where every hour of moonlight is taken advantage of, to diminish the expenditure for the public lamps, the storeage will be required equal to three nights consumption, in order to meet the demands of the five consecutive nights of complete lighting, to provide also for the gradual increase to that period, and to permit of the operations of manufacture being continuous. Between these two extreme points, a proper estimate of the required capacity of the gasholders may be formed, on understanding the various contingencies connected with the town to be lighted.

The capacity of the coal stores of a gas-work will be entirely dependent on its position, and the facilities for obtaining that material. If the works be situated in the neighbourhood of the mines, the stores may be limited, so long as immunity from strikes can be assured. But as the difficulties of obtaining regular supplies of coal increase, so must the stores be proportionably augmented in capacity. In those foreign localities where the average time occupied in obtaining a cargo of coal is three months, the storeage must be provided for the stock required for six or nine months consumption, in order to enable the agents of the company to profit by low freights or advantageous exchange, &c., as well as to provide against the contingency of vessels being lost at sea. Moreover, in many such towns, there are no resources for the gas manager to fall back upon, in the event of a deficiency of coal in store.

In some contracts for lighting foreign towns and cities which have come under our notice, the company are obliged to keep a supply of coal, equal to the requirements of their undertaking, for three, six, or nine months, as the case may be; but this, however, is never carried out, for, although that quantity of coal may exist at one period, it is

speedily reduced, occasioned by the great uncertainty of the arrival of vessels.

In concluding these remarks, we will only express our belief that sufficient has been adduced to prove that no defined rule can be observed in the construction of the various parts of a gas-work, without a thorough knowledge of all the details connected therewith, to which reference has been made.

In designing a gas-work, there are some general rules to be observed, which should be strictly adhered to—as, for example, the coal stores should be immediately adjoining the retort-house, to avoid labour in barrowing. They should also be so situated as to give the greatest facility for cartage, or other means of bringing the coal into the works. The coke-spreading floor in small works is usually in the yard near the retort-house, and no place can be better; but, like the retort-house, it should always be paved, either with fire-brick or good hard stocks. In like manner the exhausters should be immediately adjoining. The purifiers and tar-well, as a matter of precaution, are placed at a considerable distance from the retort-house, and free ventilation should always be provided for the former.

The roof should be made with iron principals and covered with slates. A very common error is to cover small retort-houses with sheet iron, and sometimes corrugated, for the purpose of diminishing the thickness of the sheets. Sheet iron, under all conditions, on account of the various gases and steam existing in a retort-house, is very speedily destroyed, and should never be used, more particularly as the price of slates is very moderate, these being, when fixed in the neighbourhood of London, about 40s. per square (100 square feet).

The gasholders may be placed at a distance from the rest of the apparatus, depending on the conformation of the ground. The station-meter, governor, and exhauster, when the works are of sufficient capacity for these apparatus, should all be readily accessible, without exposing the man in charge unnecessarily to the influence of the severe weather. In small works these precautions are particularly recommended.

When treating on gasholder-tanks (in chapter 60), the method of estimating the quantity of brickwork was given, which method is also applicable to other buildings, as retort-houses, coal-stores, &c. In the measurement of these structures, the whole area of the walls, including the doors and windows, is estimated, unless otherwise specified; it being considered that the extra labour occasioned by these, with the cost of centres, &c., compensates for the material saved by the openings. In all cases, however, the style of building, the height and thickness of the walls, are all considered when calculating the price per rod, which will vary from £12 to £16, according to circumstances, particularly the cost of building materials.

In all places, no matter where, the building material generally employed on the spot must be adopted. This may be either brick, rubble, sandstone, &c.; and, although the former, as made in the locality, may vary most materially in size and quality with those the contractor has been accustomed to, it would be absurd to endeavour to make any change, as such a course would be attended with considerable loss and vexation. Where rubble is employed, the resident workmen are, as a rule, skilful in building with it; and although soft sandstone does not appear the best material for the buildings of a gas-work, the engineer will at times find this the only material to be procured for the purpose, and he must, therefore, employ it.

Although gas lighting has made such extensive progress in England, that we find fully one-third of the Metropolis at the present time supplied by one company, with a capital approaching to seven million pounds sterling—far surpassing the alleged wild visionary imagination of Winsor—there are also small towns and large villages in the United Kingdom, with populations ranging from 700 to 800 persons, which are supplied with gas from works anh mains especially provided for the purpose. The convenience whied this gives to the inhabitants cannot be questioned; but, unless the most favourable conditions exist for procuring coal, the enterprises are not often successful commercially. An illustration of this fact occurs to us at the present moment, in the case of a small English inland market town, with a population of about a thousand inhabitants, having its own gas-works, &c., with a capital of £1500, and a gross gas-rental of £260 per annum. The company carried on their operations for two or three years at a loss, after which, a gentleman of the locality, having other occupations, in order to prevent the stoppage of the works, took them on lease for a period; but, with all his business capacity and energy, they could not be made to pay. Nor can this be surprising, when we learn that the coal for carbonizing cost more than half the yearly income, and that no coke was obtained for sale. Out of the other part of the revenue (£120), rent and taxes and wages had to be paid, the collector and secretary (for these existed, although in the same person), had to be recompensed, and the various petty expenses had to be met. Under these circumstances, it cannot be wondered at that an establishment on such a limited scale should be unproductive.

(To be continued.)

PRICE OF GAS IN NEW YORK.—We are glad to be able to chronicle the action of four of the leading gas companies in this city towards meeting the stringency of the times. As we have before stated, it is not to be expected that the gas manufacturers of this country are going to escape the effect of hard times any more than any other interest. The present price of coal favours this reduction of price, which makes gas as cheap in New York as ever it was, and no man can deny that the quality is much better. Good, honest 17-candle gas, at 2·50 dols. per 1000 feet, certainly ought to satisfy any one as regards quality, and most people as to price. There are some, however, whose personal ends may be satisfied, or who think they can make small capital by raising a noise, who would never be contented with any price.—*American Gaslight Journal.*

Correspondence.

RETORT-SETTINGS.

SIR,—The attention which your "Treatise" on the construction of gas-works is receiving from many correspondents, induces me to add my mite on the above portion of the subject, while it is yet fresh in the minds of your readers.

There is no part of gas-works construction so various in the form in which the details are carried out, as that of retort-setting. Decidedly, this ought not to be. There is only one best way in which retorts can be set in any case, and there are only about two or three cases where variation should enter—namely, retorts to be heated by coal, by coke, or by tar.

If this subject had been discussed long ago, as it is now, in the pages of the JOURNAL OF GAS LIGHTING, by practical men, we should now have been nearer that uniformity which represents the *best*, and the pages of the JOURNAL—valuable as they are—would have been still more valuable.

I hope, next week, to be able to send you a sketch of how I set two and three retorts, being the number to which your drawings in last issue refer; and, at present, I propose to devote a few lines to a friendly criticism of Mr. Hall's design, published by you last week.

The setting shown by Mr. Hall is very simple, the flues being very accessible; and this is a very important matter, for often retorts have to be rebuilt, not because they are worn out, but because they will heat no longer, through the flues being choked.

Now, in the setting in question, each of the flues most likely to stop could be cleaned from openings formed in the front wall. I suspect Mr. Hall proposes to heat his retorts by the inferior coke—or *cinders*, as they are called in Scotland—produced from cannel coal, so largely used there.

In such case, perhaps, the retorts would stand unprotected, as he shows them, on a 4½-inch wall that forms the side of the furnace, from about 9 inches above the fire-bars; but such a construction would not stand long in a furnace in which Newcastle coke was used.

Mr. Hall shows no jutting bricks, to support the two outside retorts against the sides of the oven. This, I take to be a mere omission in the drawing; for, after supporting the top retort on a flat arch, sprung from the retorts on each side below, he would not expect the latter to maintain their position and form without outside support; and I mention this as a hint to any one who may think of adopting the setting.

As an instance of the variation permissible in the best forms of settings, I notice a radical difference between the size of the furnace which the JOURNAL plate of a drawing of three retorts shows, as compared with that Mr. Hall shows.

Your design shows only one fire-bar; Mr. Hall's shows six.

I question the necessity for so many fire-bars, even with a very inferior fuel. I know that one is sufficient where coke from good caking coal is used. I remember reconstructing retorts where the furnaces were 18 inches wide at the bars to heat three retorts. I rebuilt them with 6-inch bar space for six retorts, with, of course, a very large economy of fuel.

Where the bar space is so wide, we produce a large volume of heat, but at a low temperature. The same is the case in a steam-boiler, and there it is needed, where the bar space is narrow; the air passing through at a greater velocity, burns the fuel at a higher temperature, and this is what is required for the distillation of coal.

Another difference between the furnaces is that Mr. Hall's is vertical on the sides, whereas yours is bevelled; the latter is decidedly the better, and for this reason: In your furnace, as the fuel burns down, it will close in, owing to the bevelling of the sides of the furnace; in the other, when the fuel gets thin on the bars, there will be holes in it, through which air will pass, which will not be brought into proper contact with the fuel, which thus will not be converted into carbonic acid, and has, therefore, entered for no good purpose.

Mr. Hall's setting would be stronger and better if he were to take out a bar at each side, and bevel the sides of the furnace by closing it in at the bars.

There is one other point on which I disagree with both Mr. Hall and yourself, and, as it is an important one, I trust to that broad-mindedness which has characterized the JOURNAL OF GAS LIGHTING of late years, to allow me to place my views before your readers, and not only before your readers, but before your writers, so that my experience, which is, perhaps, equal to theirs, may be weighed in the balance of reason—a balance in which I have supreme faith, and, if my views should kick the beam, I will apologize, as every man ought to do. I refer to the question whether we should, or should not, protect the retorts by cross walls, touching the sides, or touching the arch of the oven if you will. Mr. Hall shows no such protection; you recommend that there should be none, and you give reasons: "The best clay retorts neither expand nor contract when heated to the temperature necessary for carbonizing coal. Fire-bricks, on the contrary, expand by heat; consequently, the arch and brickwork, as shown in fig. 6, when heated, will press against the retorts, and cause them to crack."

There are two propositions here, which require to be examined.

First, that retorts do not expand, but bricks do.

Now retorts and bricks are made of precisely the same material—namely, fire-clay, a compound of silica and alumina—and it appears to me that if the one should expand by heat the other should; but there may be reasons against this assumption, and for these I wait.

Second, if fire-bricks expand by heat, those in the arch must rise, and therefore could not press on the retort; and every one knows that they do, for there is nothing more common than, in heating up settings, to see a crack in the upper portion of the arch.

We also know, that if the supports to the hydraulic main are over the arch, it gets out of level; highest where the settings are lit up, lowest where they are out of action.

These facts prove what your writer states, that heat expands brickwork. But I am not satisfied that it does not also expand retorts.

I know that when clay retorts get reduced in temprature they leak, and it is only when clay retorts are at good heat that they are stanch. This may, or may, not be due to expansion and contraction; I only suggest it.

Again, I know that heat both expands and contracts brickwork. There never was a brick that entered a furnace but what was smaller

when it came out than when it went in; and no arch or division wall in a set of benches but what was lower after service than when it left the builder's hands—all due to the continued heat to which it had been exposed. Hence, if you wish furnace work to stand well, it must be built of well-burned bricks, because they shrink the least, and set in the thinnest joints of fire-clay, which has all its shrinkage to undergo.

I have set clay retorts with and without cross protecting supports, and I prefer the former, because, quite apart from the objections you urge, I know that when a retort is supported, a fracture may take place at a part which the cross wall will support, and but for which a piece would fall out.

It is fair also to state that I have heard of retorts on the Continent that can be set without any intermediate support between the extreme ends, and yet stand well. I have never seen this, and until I do, I fear I shall remain sceptical—an unfortunate state of mind to be in, but one which certain kinds of human nature cannot help, and which I trust more believing brethren will tolerate.

35A, *Great George Street, March* 18, 1876. GEORGE ANDERSON.

PHOTOMETRY.

SIR,—Having just read, in your last issue, the remarks upon this subject by Mr. Young, of the gas-testing station at Beckton, and esteeming it one of some importance to your readers, I take the liberty of troubling you with my views upon it by way of further elucidation, seeing that I have given the matter some attention.

I thoroughly agree with Mr. Young as to the source of error in having the candle-wicks bent in an opposite direction to the photometer disc while burning (as also, of course, in having them bent towards the disc), but I do not agree with him as to the remedy which he proposes—namely, that of making the tips of the wicks *face* or *bow* to each other; as, were I to do so, I should bow also to a second error, and that one in an exactly opposite direction, inasmuch as, by placing the flat side of the candle-flames towards the disc, a light of greater than the mean intensity of the candles would be elicited, resulting in a diminished indicated illuminating power of the gas under examination.

I submit that the position of the two flames required to give the best average intensity of light, is to arrange one with the tip in an opposite direction to the photometer disc, and the other in the position recommended by Mr. Young, with the flat side of the flame towards the disc, and at a right angle with the first; and thus, with an inferior light on the one hand, and an excessive one, of equal value, on the other, a good mean is obtained.

What may have been the practice of others I cannot say; but it is long since I laid down the rule, and taught it to others, that any random or other positions of the wicks than those I have just named are incompatible with accuracy in results, and I have ever since followed it.

Paisley Gas-Works, March 16, 1876. GEO. R. HISLOP, F.C.S.

SIR,—Referring to the remarks of your correspondent, Mr. W. C. Young, I am surprised to learn that he uses an instrument, the construction of which is a complete error, consequently, the results obtained by the use of it cannot be satisfactory. First, the medium through which the light is valued on the disc is confined, rarefied, and unnatural, and, therefore, does not give a commercial test. Second, the chimney on the top of the box directly over the Argand burner, conducting the spent gases from the flame, has not the same relation to the chimney at the other end, conducting the spent gas from the candle, because it must, from its position, draw the atmosphere in an angular direction, thereby disturbing the most essential law affecting the proper combustion of the candle. Third, dragging the candle, to balance the observation, through and against the vertical inclination of the atmosphere, is a most absurd action. Fourth, weighing the candles on one point, placing them on another at a distance during the time of test, after the test taking the candles off the second point back to the first to re-weigh them (and perchance losing somewhat in carriage), are most unscientific actions, and must place the Evans photometer alongside of the old stage-coach compared with the improved iron horse. It is, therefore, not an instrument to find out defects in the candles, but rather an instrument which is the cause of their defects.

Photometry is, and ought to be, a careful manipulation, conducted like chemical analysis, time being a most important factor, not so much in the duration of the test, as in the art of starting exactly when the cups are formed, and the outer edge of them cool in consequence of the equal column of atmosphere rising by the heat generated from the steady combustion of the candle. These conditions complied with on a Bunsen photometer, fixed balance, with fixed candle-holders attached, wicks 1½ inch apart, and space between the candle-holders ⅝ inch, the balance-beam resting between the ⅝ space, from which the candle-holders, after the balance is struck, continue to rest during the test—such an instrument is much more sensible compared with dragging the candles through the atmosphere, using the disc in box on easy friction pulleys for the purpose of balancing the observations, instead of the candles.

The motive which prompts me to intrude on your valuable space is to submit the above reasons for condemning the instrument referred to by Mr. Young, which has all the marks of fancy in construction, but is de void of every principle for the work it is required to do. My advice to all who have an Evans photometer is to strip the timber off for firewood, keep the part about 3 inches deep with scale on, set it on two pillars in a line with points between the Argand and candle 100 inches apart, and for a few shillings a disc-holder and slide may be obtained. Mr. Young may then see what, and how, the quantities are being expended during the test, and open for the necessary observations required by the experimenter, thereby enabling him to arrive at the most satisfactory results.

W. L.

SULPHUR IN GAS.

SIR,—In quarters where the matter is but imperfectly understood, one is apt to raise panic when they talk of sulphur in gas that has been proved pure by the now old clause inserted in Acts of Parliament, specifying that the gas must cause no discoloration to a slip of paper moistened with acetate of lead, against which the *unlighted* gas has impinged at 5-10ths pressure for the space of a minute.

This explanation seems necessary, because the chairman of the Paris Gas Company, through his *aide-de-camp* in London, has, in your issue of the 14th inst., defended his company against statements which originally appeared in the *Journal des Débats*, and were transferred to the pages of the JOURNAL OF GAS LIGHTING, accompanying some remarks of mine on Mr. Livesey's letter which appeared in the *Times* under the above heading.

Now, if the chairman of the Paris Gas Company, or "*Monsieur l'Ingénieur à Londres*," thinks that the Paris gas was considered in those remarks more impure than much of the gas in daily use in some of our representative English cities, let him banish the delusion at once; and if either of them thinks that the agent which bleached out the colours from the draperies at the Grand Opera at Paris was other than the products of gas consumption, he would do well to banish that delusion also.

I have seen some of the Paris gas-works, and do not hesitate to express my admiration, both of their construction and their management; and I have also enjoyed myself on the boulevards of that beautiful city, made radiant nearly as day, by an extensive use of gas nowhere else to be equalled. No city in England, where gas is at about one-half the price, can compare with Paris in general effectiveness of lighting; and I do not hesitate for a moment to believe that every word of the chairman's very diplomatic letter is absolutely true. But, having said all this, the question stands precisely as it did.

I will not ask, is the Paris gas free from sulphur? but, is it as free as it would be, were a sufficient quantity of lime used to take out the whole of the carbonic acid, and used in a manner by which also it will takes out sulphur compounds, which oxides of iron, or the other metals, allow to pass on to be burnt, and then developed by the products of combustion? This is the question.

It is of no use telling us, by way of reply, that the "most eminent chemists have been consulted." Unfortunately, the "most eminent chemists," until the other day, knew just about as much as less eminent chemists. An eminent English chemist, 20 years ago, discovered the existence of this compound of sulphur, which eludes the ordinary tests. But it is one thing to discover a disease, and quite another thing to discover a practical remedy—not, in this case, in the laboratory, but on a manufacturing scale.

The best English gas companies have not been able to remove this impurity; it is no comparative degradation to French companies if they have been equally unsuccessful.

But, if they know more about it than we do, we shall be glad to learn from them. How do they purify gas—what are the agents, and the *modus operandi*? This stated, we shall be able to form a tolerably accurate conjecture.

We have it, on the authority of Mr. Livesey, that the purification of the Paris gas is effected by oxide of iron. I have some knowledge on the point, which places the company in rather a better light; but, as I obtained it through the kindness of the company admitting me on their works, I will leave it to be stated by some one authorized.

Now it is a truth that, in this country, neither with effective washing and scrubbing by ammoniacal liquor and water, and subsequent use of oxide of iron, can we purify gas sufficiently to comply with Acts of Parliament, which tolerate 20 grains of sulphur in every 100 feet; and I further believe that it is the opinion of the most eminent chemists that, without the use of lime or some other alkali, *in a free state*, it cannot be done.

The use of lime is a nuisance—only because there is an offensive odour from it; but, as this only affects the neighbourhood of a gas-work for the short time that it is being removed from the purifiers, and in no case, although offensive to the nose, has it ever been proved to be injurious to health, it is a question for the public whether it would not be better for them, were they to agree to have the gas well purified, and suffer this very temporary inconvenience *out of doors*, rather than put up with gas that is not so well purified, and have all the impurities brought *indoors*. I think public opinion requires being educated on this point.

The outcry that has existed for some years now, against the use of lime, and has led to the use of iron instead, is, in my opinion, a ridiculous folly that cannot be accepted by a rational mind.

Great improvement has taken place in the purification of gas since that outcry began, by which much of the impurity that formerly was left in the lime is now abstracted before the gas gets to the lime, and is now retained in the liquids from the washers and scrubbers, and from the great efficiency that these have attained, only about half the quantity of lime is now required, and that smaller quantity has much less smell than formerly.

Gas companies ought to reply to complaints of smell, "Well, it is a question for you, the public, who burn the gas—it is a question of little importance to us; we can use oxide of iron, which smells less, but does not so well purify the gas, or if you put up with a little smell when the purifiers are being changed, which is soon dissipated in the atmosphere, we can ensure you a more salubrious gas for consumption in your dwellings. And we would rather do this; for, although purification by lime is a trifle more expensive than by iron, yet we know that the purer we make the article, the more you will use of it; and as it is the cheapest and, when well purified, the best light you can have, it is your interest, if you can see it, to support us, instead of railing against us."

One thing is certain. At the present time we cannot purify gas without the aid of lime. Further discoveries may enable us to do so; but until they do, let gas companies pluck up the courage to honestly state the facts, and not attempt to disguise them under a cloud of words, which, to those who can properly weigh them, amount to nothing.

35A, *Great George Street, March* 18, 1876. GEORGE ANDERSON.

GOVERNORS TO METER-LAMPS.

SIR,—In my letter of last week's issue, under this head, the words "*our* governor" occur at page 382, in the fifth paragraph, instead of "*no governors*," as written in my MS.

Glasgow, March 14, 1876. WILLIAM KEY.

BEVERLEY CORPORATION GAS-WORKS.—At the meeting of the Beverley Town Council on the 14th inst., the Gas Committee reported that they had received the authority of the Local Government Board to borrow £3000 on the security of the general district-rate, for improvements at the gas-works, and that they had obtained an offer of the money at 4½ per cent. The town-clerk had been directed to inquire whether it could be obtained on more favourable terms. The committee were in a position to negotiate with the War Office for the supply of gas to the new barracks, and would shortly report on the subject. The sanction of the council was given to the borrowing of the money.

Parliamentary Intelligence.

HOUSE OF LORDS.

TUESDAY, MARCH 14.

The following bills (opposed) were committed:—Galashiels Municipal Extension, Police, and Water, Leigh and Hindley Local Boards, Llandudno Improvement, Braceborough Water, Edinburgh and District Water, Sutton Gas, Llandudno Water and Gas.

FRIDAY, MARCH 17.

The Derby Gas and Shepton Mallet Water Bills, brought from the Commons, were read the first time, and referred to the Examiners.

The Galashiels Municipal Extension, Police, and Water, Braceborough Water, Edinburgh and District Water, and Leigh and Hindley Local Boards Bills, were referred to a select committee, consisting of the Earl Ducie (chairman), Lord Northwick, Lord Dunsany, Lord Romilly, and Lord Blackford; to meet on Tuesday, March 21.

The Sutton Gas Bill was referred to a select committee, consisting of the Duke of Bedford (chairman), Earl Wharncliffe, Viscount Canterbury, Lord de Ros, and Lord Saltoun; to meet on Tuesday, March 21.

HOUSE OF COMMONS.

MONDAY, MARCH 13.

The Derby Gas and Shepton Mallet Water Bills, as amended, were considered; to be read the third time.

The Newcastle and Gateshead Water, Spennymoor and Tudhoe Gas, and Walsall Improvement Commissioners Gas Purchase Bills were read a second time and committed.

BURGHS AND POPULOUS PLACES (SCOTLAND) GAS SUPPLY BILL.—Petitions in favour of this bill were presented from Burntisland, Johnstone, Macduff, Renfrew, and Stirling.

Petitions in favour of the Ramsgate Local Board Bill and against the Ramsgate Water Bill were presented from ratepayers and inhabitants of Minster; and in favour of the Ramsgate Local Board Bill and against the Ramsgate Water and Thanet Gas Bills from ratepayers and consumers of gas and water in St. Lawrence.

Requisitions to withdraw their petition against the Chesterfield Water and Gas and North-East Worcestershire Water Bills were presented from the Midland Railway Company and the Redditch Local Board of Health respectively.

TUESDAY, MARCH 14.

The Ramsgate Water and Thanet Gas Bills were reported; parties do not proceed.

The Bristol United Gas Bill was read a second time and committed.

BURGHS AND POPULOUS PLACES (SCOTLAND) GAS SUPPLY BILL.—A petition in favour of this bill was presented from Lockerbie.

A requisition to withdraw their petition against the Bristol United Gas Bill was presented from the Great Western Railway Company.

The Littlehampton Water and West Brighton Water Bills were referred to a select committee, consisting of Mr. Backhouse (chairman), Mr. William Legh, Captain Hood, and Mr. William Holms; to meet on Tuesday, March 21.

The Stockton and Middlesbrough Corporations Water, Stockton and Middlesbrough Water, Southport Improvement, and Lancaster Water and Improvement Bills were referred to a select committee, consisting of Mr. Orr-Ewing (chairman), Colonel Ruggles Brise, Lord Rendlesham, and Mr. Shaw; to meet on Tuesday, March 21.

WEDNESDAY, MARCH 15.

The Folkestone Gas Bill, as amended, was considered; amendments made. Bill to be read the third time.

BURGHS AND POPULOUS PLACES (SCOTLAND) GAS SUPPLY BILL.—Petitions in favour of this bill were presented from Stranraer, Lockerbie, and Maxwelltown.

A requisition to withdraw their petition against the South Metropolitan Gaslight and Coke Bill was presented from the Crystal Palace District Gas Company, and one from the London and North-Western Railway Company to withdraw their petition against the Oldbury Local Board of Health Bill.

MUNICIPAL CORPORATIONS, &C. (FUNDS), BILL.—Mr. Fielden, Mr. Monk, and Mr. Assheton each gave notice, on the second reading of this bill, to move—"That it be read a second time upon this day six months."

BURGHS AND POPULOUS PLACES (SCOTLAND) GAS SUPPLY BILL.

Sir WINDHAM ANSTRUTHER, in moving the second reading of this bill, said: The object of the bill is to empower municipal authorities in Scotland to manufacture and supply gas for public and private purposes, where they cannot do it at present without coming to Parliament and obtaining a private bill applicable to each locality, a course of proceeding involving an outlay, under the most favourable circumstances, of from £500 to £800. and thus acting as a complete bar in the case of the authorities of the smaller burghs. The present bill will enable such municipalities to enter into more desirable arrangements in future. It does not apply to any burgh, or to any district, where there is a local authority or a gas company having statutory powers to supply gas, or actually supplying gas. When the commissioners, who are the local authorities under the bill, shall have received the consent of the ratepayers, they may erect gas-works, or purchase such gas-works as may have been already established in the burgh. Every care has been taken in the bill to guard and protect existing rights and interests; and, if this had not been the case, the bill would not have been an enabling but a confiscating measure. In the case of burghs where there are companies established by private enterprise for the supply of gas, it is optional for them to sell their undertaking to the commissioners; but it is compulsory on the commissioners to make an offer to purchase the existing gas-works (provided that the shareholders are willing to sell) before they can avail themselves of the provisions of the bill. The commissioners and the shareholders of the existing gas companies are free to make their own bargains, and it is only where there is a difference of opinion between the shareholders and the commissioners, as to the price to be paid for the undertaking, that that price is to be settled by arbitration. The bill is a general bill, applicable to all the many burghs of Scotland, no two of which, however, are alike, and it would be found quite impossible to draw a hard and fast line. The commissioners are elected by the ratepayers. They are themselves, in most instances, the largest ratepayers in the district. One-third of their number is renewed annually, and this, in my opinion, is the best guarantee that can be found against an exorbitant price being charged for gas, or any extravagance being resorted to in the management of the undertaking. Under the bill, no profit can be derived from the undertaking when acquired by the commissioners, and if in any year the receipts exceed the expenditure, then the balance must be carried on to the following year, and the price of gas reduced proportionately. I think it right to mention that, by an oversight on my part, in correcting the proof of the bill, a very important omission was made in clause 43, line 34, page 21 of the bill. After the word "charges," these words should be inserted, "of each preceding year." With the permission of the House, I propose to correct the mistake in committee. There are various other clauses in the bill for the protection of the shareholders when the commissioners have acquired the interests of a company, and for the guidance of the commissioners, but as these will have to be considered in the future stages of the bill, I will not now detain the House by going into them. It may be asserted that the bill confers two great powers upon the local authorities, but in the General Police and Improvement (Scotland) Act and the Public Health Act, powers, quite as extensive, have already been conferred upon them by Parliament. The result has been pre-eminently satisfactory, and this bill merely involves a slight extension of those powers, which have already been used so wisely and so well. If this bill passes into law, I believe it will confer a great boon upon Scotland, and it will be the means of saving many thousands of pounds to the ratepayers of that country. I may add that, in preparing it, I have received the aid and assistance of the Lord Advocate, and of honourable members on both sides of the House. In conclusion, I venture to express a hope—it may be an ambitious, but I hope it will not be a vain one—that, in the course of the present session, the bill may become law. I now beg to move the second reading of the bill.

Sir G. BALFOUR: I most express my approval of the scope and general intention of the bill, but I believe it is capable of still further improvement. I have not the slightest doubt that Scotland will derive very great benefit from the provisions of the measure; but, at the same time, I must say that I think there is great danger that the interests of the shareholders in the gas companies might be injuriously affected. In order to avoid this difficulty, I have placed certain amendments upon the paper similar to the amendments which I proposed last year. I understand that the bill is to be referred to a select committee, and, therefore, I consider it is not necessary to enter further into the nature of those amendments on the present occasion.

Sir E. COLEBROOKE: If at any time I have taken a part which may have appeared hostile to this bill, I wish to state, in the most emphatic manner, that, so fear from regarding the bill as being objectionable in principle, it is one to which I gave a cordial support when it was introduced. I believe that it was desired generally by my constituents, and, if it had passed in the form in which it was originally introduced last year, it would have passed without a word being said by me. Later in the session it appeared in a new form, in which certain exceptions were made, which I conceived injuriously affected the interests of my constituents. It is to be proposed that the bill be referred to a select committee, and I will not, therefore, enter into details at this stage of the measure, as I have no doubt every question will be fully considered by the committee. I only wished to explain the course which I took last year. I thought the changes which had been introduced were so strong that I took a step at the end of the session which was fatal to the passing of the bill. I do not feel any regret at having taken that course, especially as the result will be that the whole matter will be fully considered by a select committee. The objection which I took had reference to the second clause. The bill, as originally introduced, gave general powers to all burghs to take over gas-works, but ultimately it proceeded with a great deal more circumlocution, and provided various exceptions in regard to the operation of the bill. Among other places the rights possessed by Glasgow were not to be interfered with. The present bill introduces the same principle, that the bill shall not be applicable where any other burgh enjoys a statutory right in regard to the supply of gas. The effect of this would be to prevent a number of burghs in the neighbourhood of Glasgow from taking advantage of the Act. I do not think it would be wise for the House to lay down so broad a principle as that a statutory right possessed by a county or burgh should debar any other burgh from exercising the same right. In the burghs in question, although Glasgow has bought up certain rights which were formerly exercised by gas companies, and has obtained statutory powers, those statutory powers, which are only permissive in themselves, have scarcely ever been exercised, and the whole supply is provided by independent gas companies, who have no statutory rights at all. I cannot see why on earth these burghs, under such circumstances should be debarred, under the provisions of this bill, from having the same powers as other burghs, and I cannot conceive why any burgh which has obtained statutory rights beyond its own boundary, should be in a different position from a company in a case where it is desirable that the works should be in the hands of the ratepayers. I do not think that they ought to be restricted in the way proposed, but the question is one of principle, which might fairly be considered by a committee. I look upon the bill as a beneficial one in its general purport, and I was only anxious to make these remarks by way of explanation.

Mr. CECIL RAIKES: This is a bill of very considerable importance, not only to Scotland, but to other parts of Her Majesty's dominions, because it raises a question of very considerable importance. That question is the expediency of investing local authorities with the control of the gas and water supply of their respective districts, and I think that the tendency of public opinion has, during the last few years, been setting in more or less strongly in that direction. In fact, it has almost become an axiom of policy to invest these powers as far as possible in the hands of the municipal authorities, in the belief that they will generally be better administered by them than when in the hands of private companies. Very great difficulties, however, frequently arise with respect to the action of municipalities in matters of this description; but I must say that, looking at recent legislation with respect to them, I think there is one great disadvantage attending the case of public bodies, as compared with private companies in passing measures of this description through Parliament. This arises from the fact that the municipal bodies are placed under the strict surveillance of public departments; for when bills for the acquisition of gas or water works, promoted by local bodies, come before committees of this House, reports are made upon them, either by the Local Government Board or the Board of Trade, and all of the circumstances, if any of them are objected to, have to be thoroughly considered. But these inquiries are not made in the case of private companies, in which the interests of the ratepayers are not supposed to be directly concerned. I therefore regard with satisfaction any measure for the transfer of such works as these to the municipalities, and whilst expressing a general opinion in favour of this bill, I cannot conceal from myself that it is proposed in it to take a rather novel and anomalous step, which, I should say, is in the direction of what is sometimes called Home Rule; because it is proposed by one of the most important clauses of the bill, the 19th, to transfer the jurisdiction, hitherto exercised by Parliament in matters of this description, to certain local authorities of the neighbourhood directly affected. So that when the commissioners to be appointed under this bill propose to acquire on behalf of the municipality any gas-works, they will have to go before the sheriff instead of applying to Parliament as heretofore, with the view of obtaining powers to purchase or erect gas-works in the case of any burgh in which there may already be a private company not incorporated by Act of Parliament. The honourable gentleman opposite (Sir George Balfour) has given notice of a series of amendments, in which he endeavours to sketch a scheme for the guidance of the commissioners, and the conduct of arbitrators under the Act. I think, however, that there is a principle of great importance involved in this part of the bill, for it is certainly a great innovation in point of practice of the House with respect to private business, that it should be referred to the sheriff in matters in which legislation has hitherto been only allowed with cognizance of Parliament. If these commissioners now sought to exercise powers to the extent proposed in this bill, they would have to come to Parliament for a private Act, and any of the parties interested, especially any of the private-venture companies, would have an opportunity of appearing before a committee of this House, of stating their case according to their view of it, and of vindicating what they believe to be their rights. In short, they would have the fullest opportunity of making the best case they could for themselves. If, however, this measure becomes law, these parties will be deprived of this privilege, and this is a matter which will require very deliberate consideration, for it is one which it will be impossible to confine to Scotland alone. If this measure should become law, it will be necessary to consider the case of Ireland, and

also that of England. The House will, therefore, see that this is a matter of considerable importance to all parts of the United Kingdom. There is another point which the honourable baronet, the member for Lanarkshire, has referred to—with respect to clause 2, which makes objections as to the working of the Act. The exception to which the honourable baronet objects, relates to a point which is purely of Scotch interest at this moment; but it raises a point which has so often been debated in this House in reference to private bill legislation—namely, the powers which a great city like Glasgow is to exercise over the smaller burghs aggregated round it. This point is one which has always excited great interest amongst Scotch members; and I know of none which has produced so much feeling as this question of the relations between Glasgow and the smaller suburban places in its neighbourhood. I hope, therefore, that the House will accede to the suggestion which I shall make, of referring this bill to a select committee. That committee should, for the most part, consist of Scotch members, as the question is one which is chiefly interesting to them as far as this measure is concerned. But I cannot, at the same time, conceal from myself that it is a matter which may come to be of interest to districts similarly situated in England and Ireland where there are large towns surrounded by smaller suburban communities. There is another point which is also worthy of consideration to which the honourable baronet who introduced the bill has not now referred, but to which he called my attention a few days ago. He was then of opinion that this measure would give power to the local authorities in Scotland, similar to those conferred upon local authorities in England under the Public Health Act; but I have to point out to him, and to the House, that there is a very important difference between the two cases, for the whole procedure under the Public Health Act is conducted by means of Provisional Orders, which do not withdraw those matters from the cognizance of Parliament. It is open to any one to oppose those Provisional Orders, which would then be referred to a select committee, and all parties who desired it would be heard before that committee. It can hardly, therefore, be said that this bill is an extension of the powers given under the Public Health Act to Scotland. I hope, therefore, that the House will think it desirable to appoint a select committee; but I do not think it is a matter of course that the committee should have power to send for witnesses, papers, or records, for I think that these are points which should be considered as matters of principle without reference to particular or individual interests. But, as it is desirable that the committee should have before them all matters necessary to guide their deliberations, I would venture to suggest that the petition deposited the other day by the honourable baronet opposite should be referred to the committee, that they may have the opportunity of considering it, together with the bill. It is also desirable that the select committee should be composed of those who would be able to speak with authority on the subject, and able to guide the House with respect to its future course on this question.

Mr. ORR-EWING: I am authorized by the honourable baronet who has brought in the bill to state that he has no objection to refer the measure to a select committee. The objections which have been taken by the honourable member for Lanarkshire are scarcely objections to the bill, but apply rather to the city of Glasgow, which is in a peculiar position in regard to the supply of gas to the neighbouring burghs. Glasgow has purchased gas-works, and provided a gas supply for these neighbouring burghs; but the gas was before provided by independent companies, and it will be a great hardship upon the city of Glasgow if the suggestion of the honourable member is carried out. As the petition deposited by the honourable member is to be specially referred to the select committee, I think that the memorial which is about to be presented by the city of Glasgow should also be sent to the same committee, so that they may have an opportunity of explaining the position in which they stand with regard to these burghs.

The bill was then read a second time.

Mr. C. RAIKES moved that the bill be referred to a select committee.

Sir G. BALFOUR expressed a hope that the order would be sufficiently comprehensive to include not only the memorials which had been mentioned, but any others which might be presented.

Sir E. COLEBROOKE wished to make one suggestion in regard to the composition of the committee. It was his opinion that the majority of the committee should not be composed of Scotchmen, but that they should be persons of experience, who would take a proper view of the matter.

The motion was then agreed to.

THURSDAY, MARCH 16.

The Derby Gas and Shepton Mallet Water Bills were read the third time, and passed.

BURGHS AND POPULOUS PLACES (SCOTLAND) GAS SUPPLY BILL.—Petitions against this bill were presented from Govan and Partick, Hillhead and Maryhill, and referred to the select committee.

Petitions against the North-East Worcestershire Water Bill were presented from (1) Corporation of Droitwich, (2) Bromsgrove Local Board and Town Commissioners.

The following petitions have been withdrawn:—Lancashire and Yorkshire Railway Company against the Dewsbury and Heckmondwike Water Bill; Corporation of Birmingham against the Oldbury Local Board of Health, Smethwick Local Board, Tipton Local Board, Walsall Gas Purchase and Borough Extension and West Bromwich Improvement Bills; Great Western Railway Company against the Oldbury Local Board of Health and West Bromwich Improvement Bills; Ironmasters, &c., outside the boroughs of Stockton-on-Tees and Middlesbrough against the Stockton and Middlesbrough Corporations Water Bill; Midland Railway Company against the Wakefield Water Bill; London and North-Western Railway Company against the West Bromwich Improvement Bill.

FRIDAY, MARCH 17.

On the motion of Sir Charles Forster, it was ordered—"That the minutes of the evidence taken before the committees on the Stockton, Middlesbrough, and Yarm Water-Works Bill, in session 1851, the Stockton and Middlesbrough Water Bill, in session 1864, and the Weardale and Shildon Water Bill, and the Stockton and Middlesbrough Water Bill, in session 1875, be referred to the committee on the Stockton and Middlesbrough Corporations Water Bill, and the Stockton and Middlesbrough Water Bill."

The Ramsgate Local Board Bill was reported, preamble not proved.

BURGHS AND POPULOUS PLACES (SCOTLAND) GAS SUPPLY BILL.—Petitions were presented against this bill from Glasgow, and in favour of it from Air, Airdrie, and Huntley; all being referred to the select committee.

A petition against the Walsall Improvement Commissioners Gas Purchase Bill was presented from the London and North-Western Railway Company.

The petition against the Dewsbury and Heckmondwike Water Bill of Montagu George Burgoyne has been withdrawn.

SATURDAY, MARCH 18.

A petition in favour of the Stockton and Middlesbrough Corporations Water Bill was presented from Ironmasters of Stockton, and one against the Kildwick Parish Gas Bill from Samuel Tetley.

The petitions have been withdrawn against the North-East Worcestershire Water Bill of Charles Perrot Noel and others, against the Stafford Borough Extension Bill of Lord Stafford, and against the Stockton and Middlesbrough Corporations Water Bill of Stockton and Hartlepool and Darlington Highway Boards and others.

HOUSE OF COMMONS COMMITTEE.

TUESDAY, MARCH 14.

(Before Mr. BATHURST, *Chairman; Mr.* HAYTER, *Mr.* DUNDAS, *and Mr.* CORDES.)

RAMSGATE LOCAL BOARD BILL.

Sir E. BECKETT, Q.C., Mr. RICHARDS, Q.C., and Mr. O'HARA appeared on behalf of the promoters; Mr. POPE, Q.C., and Mr. MICHAEL appeared for the petitioners, the Thanet Gas Company and the Ramsgate Water Company, who, on the meeting of the committee, withdrew the bills which they had promoted for increase of capital, extension of works, and other purposes.

Sir E. BECKETT, in explaining the objects of the bill, said it was introduced by the Local Board of Ramsgate for the purpose of compulsorily purchasing the water and gas works of the town. He was aware that this was a strong thing to do, and, in fact, an unprecedented thing, except under unprecedented circumstances. Whenever Parliament had found that a water company or a gas company had been carrying on their business properly, giving a sufficient supply of good water or gas, they never authorized a local board or corporation to take the works by compulsory purchase. But when such was not the case, it was now universally agreed that it was better that corporations should have the supply of water and gas than private companies. That was now such an axiom that he believed only one man living, Mr. Hawksley, disputed it. Every Royal Commission that had considered the subject, and many parliamentary committees, had come to the same conclusion—that, where there was nothing in the way to prevent it, it was far better for the public that corporations should have the supply in their own hands. When gas or water companies were competing with one another in the same town, Parliament had, whenever the opportunity occurred, put an end to that state of things. This was the case in Leeds, Glasgow, and Dundee, where, notwithstanding the fact that the companies were carrying on their works well, the towns said they were sick of the competition, and Parliament compelled the companies to sell to the corporations. Last year the water company and the gas company of Birmingham had bills of their own, and the corporation also had a bill to purchase. The gas company wisely settled with the corporation, but the water company fought to the end and were beaten, on the ground that there had been a previous agreement that they should sell. Another important case was that of Rotherham, where compulsory powers were granted, though there was not one-tenth cause of complaint that there was in the present case. Two or three years ago the Neath Local Board brought in a bill for purchasing the water-works, and made very strong charges against the water company of not giving a full supply; but, by good luck, the company had the means of giving it, and by further good luck, they had begun some works before the bill was brought in. It therefore could not be said that the company were merely promising to do something in order to get rid of the purchase, and the committee were so satisfied of that, that they said the time had not come for transferring the works to the corporation; but they used some very strong and unpleasant expressions about the misconduct of the company in past times, and it was as plain as anything could be, that if the company had not been making improvements, they would unquestionably have been transferred. From these cases the principle upon which Parliament acted might be easily deduced. But compulsion to sell was by no means the worst thing that could befall a company, as they were sure to get guaranteed dividends. There was a much worse thing for a company, and that was compelling them to do a great deal more than they had engaged to do. In 1851 and 1852 there was a long inquiry as to the conduct of the London water companies. They were then getting their water mixed with the sewage of London, and Parliament said: "You, the water companies, exist under the condition that you shall give good and sufficient water;" and in 1852 passed a bill, imposing tremendous expense upon the London companies, by compelling them to go above Teddington Lock, and erect works which would have ruined any ordinary water companies. The London companies had not paid any large dividends from that time to the present. Again, in 1870, there was another inquiry. It was claimed by the Metropolitan Board that there was not a sufficiently constant service, and, accordingly, all sorts of obligations were put upon the companies. Parliament made it a fundamental condition upon all water and gas companies that they should do their duty. It was not necessary to go further than the two bills which the Thanet Gas Company and the Ramsgate Water Company had introduced, in order to ascertain whether they had been doing their duty. The water bill recited that they had had no Act of Parliament since the fifth year of King William IV., or 41 years ago. In their original Act they recited that a constant supply of water for the use of the inhabitants might be obtained from certain sources; but they acknowledged in their bill that they had never given it. They really gave 6 gallons per head of the population per day in summer, whereas everybody knew that 20 gallons was the minimum required. Further, they only let the water on about an hour and a half in the day, and then under such miserable pressure that people could not even fill their cisterns. As to their dividends, they paid what they liked; and as to their accounts, they did what they liked. 1835 was twelve years before the Water-Works Clauses Act, and the company had never come under it. By withdrawing their bill they now asked the committee to allow them to go on in the same way as before. But could such a company be permitted to go on supplying a population of from 50,000 to 60,000 people upon such terms? They had a small pumping concern at two places, and from one of them they actually supplied water so salt, that the South-Eastern and the Chatham and Dover Railway Companies would not use it; while from the other the supply was very hard, and, probably from some misarrangement of the pipes, the water sometimes had sewage in it. It might be contended that the consumers had the power of making good junction-pipes and services; but if they had, they ought not to, and the time had now come when such a power should be done away with. If the company had come before Parliament previously, they would have been abolished; but they were afraid of parliamentary restrictions. They had expended the whole of their original authorized capital of £15,000, in addition to £19,000 out of revenue. Of course, they knew that that was a thing which Parliament now never authorized; but they wanted in their bill to capitalize that sum, though, within the last ten years, it had never been allowed. The answer always had been: "If you choose to go on doing your work without parliamentary authority, you must take the consequence." So long ago as 1856, it was refused to the London gas companies. Another curious thing was that although there could be no doubt whatever that the supply of water was insufficient, they actually did not, in their bill, take power to give any more. Surely that was worse than the case of a town where there were competing companies; and if Parliament had said to competing companies that competition was a nuisance to the town, it was a thousand times greater nuisance to have such a company as the Ramsgate Water Company. Another peculiarity in this case was, that they had carried on their works in such a thoroughly indifferent, lazy, and careless way, that they did not know where their own mains where. When anything went wrong, they had to prick in their streets, like sextons used to prick in old churchyards for bodies. Their charge for water for public purposes was actually 1s. per 1000 gallons, and sometimes, by way of variety, there was such an intimate connexion between the gas company and the water company, both having the same chairman and the same solicitor, that they let the gas liquor get into the water-mains—a connexion both morally and physically bad. When a fire broke out, the pressure was not sufficient to supply the engines until all the cisterns in the houses had been supplied, and the whole system was going back to the days of Shem, Ham, and Japheth—only they had plenty of water. The gas

company's Act was dated 1824, and they had never been before Parliament since then. They were established only twelve years after the first London gas company, so that in those days Ramsgate was before the rest of the world, and rather a sharp place; but the great effort they made then seemed to have satisfied them for all eternity. They, like the water company, had gone on doing just as they liked. They had an authorized capital of £24,000, and in the preamble of their bill they stated that they had expended nearly three times as much as that, and they actually proposed to have all of it recognized in the bill, and a dividend of 10 per cent. authorized upon all this illegal capital. Inasmuch as they asked Parliament to give them £33,000, plus borrowing powers, making, altogether, £41,000 of new capital, they admitted that they wanted it; but now, by withdrawing their bill, they were going to do without it. The price charged for gas had fluctuated from 4s. to 5s. per 1000. He did not mean to say that there had not been some excuse for that in the fluctuations in the price of coal; but, having raised their price to 5s. when the price of coal was very high, they now, by their bill, asked Parliament to allow them to charge 5s. 6d. when the coal pressure was removed, so that they actually proposed to limit themselves to a larger sum than they charged when coal was at such an abnormally high rate as it was a few years ago. With regard to the public lamps, a year or two ago they raised their charge from £3 10s. per lamp to £5, plus 17s. 6d. each for cleaning, and the local authority had no sort of control over them; they just exercised their own discretion whether they lighted the lamps, in certain places, or not. Sometimes they did light them, and sometimes they did not. Occasionally they would leave a lot of lamps unlighted for months together; and the consequence was, that a short time ago, a part of the town was lighted with oil-lamps, and curiously enough it was found that the oil was just as good as the company's gas. After a time, they thought better of it, and consented to light the lamps. The restriction in their bill of 1824 was rather indefinite, for they were only bound to afford a better light than could be supplied by oil-lamps. The limits of supply were in some respects complicated. Their Act authorized them to supply Margate, Broadstairs, and adjacent places, as well as Ramsgate, and, in fact, they now did supply Margate, Ramsgate, and a place called St. Lawrence, but they did not supply Broadstairs. The Ramsgate works and the Margate works were, however, totally distinct; and the Ramsgate Local Board only proposed to buy the works within their own jurisdiction. The water company, in their petition, complained that the present bill took power to supply some places outside the jurisdiction of the Local Board; but there was not probably a corporation in England, having gas or water works, which were not authorized to supply such places. With regard to dividends, the Local Board were in the curious position of not knowing what they were, for the companies were under no obligation to publish any accounts, and even gossip did not afford any clue to the profits that had been made. All that was known was that now and then, when a shareholder died, a share was sold by auction, and the £25 shares realized £60. As long ago as 1873 they were asked on what terms they would sell, and though they continued to correspond on the subject, they were evidently determined, from the beginning, not to sell, and equally determined to say they would not sell. He supposed they thought it would look better before Parliament, and it positively took more than two years to get them to say they would not sell. This was such an atrocious case of bad management, that Parliament, as representing the public, ought to interfere.

Rev. *Edward Griffen Banks*, examined by Mr. O'HARA.

I am honorary curate of St. George's, Ramsgate, and head-master of the Chatham School there. I am a member of the Local Board, and have resided in Ramsgate since December, 1872. I am the owner of considerable property in Ramsgate, and a large consumer of both gas and water. The population of Ramsgate in 1871 was about 14,600, and of St. Lawrence between 5000 and 6000. In the summer time the population is increased to between 50,000 and 60,000. The rateable value of the district is over £69,000, but, by a new assessment that will soon come into force, it will be about £75,000. The Local Board are at present considering the expediency of extending the district into St. Lawrence. Under some of their Acts, the Local Board are entitled to levy 2s. per ton on coals, and they exercise that power on every ton they can get hold of. The Thanet Gas Company have power to supply gas to Ramsgate, Margate, Broadstairs, and other adjacent places, but they have not supplied it to Broadstairs. The works at Ramsgate are perfectly distinct from those at Margate. Since I have been at Ramsgate, I have heard continual complaints about the gas—against the insufficiency of the supply, against the high charges, against the mode in which the company deal with the roads, and against the sort of rough way in which they deal with the consumers. In 1873 the price of gas was 4s. 6d., and during part of the year, 5s. In 1874 it was 5s., and in June, 1875, it was reduced to 4s. 6d. In September of the same year it was reduced again to 4s., and at that price it has remained since. The company can charge anything they like with the exception of public lamps. In 1873 the charge was £3 10s. per lamp, but they raised it that year to £5. For repairing, cleaning, and lighting the existing lamps they charged 17s 6d. When the average meter system was adopted in January, 1875, the charge came to £3 7s. 10½d. as against their proposed charge of £5. We have had great difficulty in getting an increased number of public lamps, and have constantly made requisitions to the company in writing. The gas supply has been very bad, but it has been better since the agitation commenced. The pressure previously was so bad that in my chemical laboratory, where I have some stoves for certain experiments, I could not get any gas at all. I have recently had to change all my fittings, because they were so much corroded by something in the gas—ammonia, I suppose. They have since got corroded again. I have tried to get some of the company's accounts, but have failed to do so. As far as their financial condition is concerned, they are entirely independent of the consumers. There is an almost unanimous feeling in the town in favour of the transfer proposed by the bill. During the past year the question has been very much discussed at the elections, and out of eleven members there was a majority pledged to the transfer.

Mr. POPE: Ratepayers are generally in favour of seizing profitable property if they can get it.

Examination continued: In 1875 a committee was appointed by the Local Board to get inquiries answered by large towns having gas and water works under their own management, so that, from the statistics so obtained, opinions might be formed as to the advisability of recommending the Local Board to negotiate with the companies for the purchase of their undertakings. I was chairman of a subsequent committee, appointed to try and negotiate terms of purchase with the gas and water companies. We offered to purchase the gas-works on the terms of a limited arbitration, but the proposal was not accepted. The district of supply of the water company is different from that of the gas company. It includes Ramsgate, St. Lawrence, and Minster. The company have two sets of works, one at Whitehall and the other at Southwood. There is only one reservoir, and that is at the latter place. The water is obtained in both places by pumping from wells sunk in the chalk. The water obtained at Whitehall is very hard, but is otherwise good. The water at Southwood is so bad that the company do not use it if they can help it. There are a number of cesspools close to the works. The company charge for water according to the rental; 6s. for cottages under an £8 rental, if the landlord signs an agreement. Then the charge begins at 13½d., and ranges to 10½d. in the pound—between £50 and £60, 12½d. in the pound; between £60 and £70, 11½d. in the pound; between £70 and £80, 10½d. in the pound. Above £80 arrangements have to be made with the directors. The charge for public purposes is 1s. per 1000 gallons, and the supply is very deficient. We ought, at least, to have 20 gallons per head, or about 1,500,000 gallons; but in fact, we only get 300,000 gallons. The rainfall in Thanet is very small, and consequently it is a matter of vital importance to have a proper supply of water, because we have adopted the water system for our sewerage, and there is danger of the works breaking down because we have not enough water. The Local Board have tried to introduce the cistern system where they can. I do not think that any one has ever seen the company's inspectors going round to visit the houses. The company have not the slightest notion how my fittings are. I have a bath in my room, and it communicates directly with the water-main; so that, if I have a bath in the morning, and chose to turn on the wrong handle, all the dirty water would go into the main for other people to drink. When the pavement was taken up in Chatham Street, there was a water-closet connected by a short pipe with the water-main, so that all the sewer gas can get down into the water. The main and service pipes are laid close to the surface, and great inconvenience is felt by the breaking up of the streets. The Local Board are quite willing that the terms of purchase should be perfectly fair and equitable, and, in fact, wish to pay them liberally.

Cross-examined by Mr. MICHAEL: I consider it a grievance that the gas company should have charged 5s. for gas so long. They raised the price to that figure when coal was 30s. a ton, but when they took it off it was about 20s. Previous to the adoption of the average meter system we used 5 feet burners. Since then we have used 4 feet. I think there is danger of the sewage from the cesspools getting into the reservoir at Southwood if they pump there. We complain of the charges made by the water company for public purposes, and to the poorer inhabitants. The maximum charge in our bill is much lower than that proposed in the Ramsgate Water Bill. When I complained to the gas company about the gas, the nozzles through which the gas was delivered were quite new.

Re-examined by Mr. O'HARA: The bill proposes to give a constant supply of water. We object to the company charging 5s. for gas in order to enable them to apply the profits to what ought to have been done out of capital.

The CHAIRMAN: It must be taken that any answer given by this witness is given by one who knows nothing of the accounts.

Mr. *William Alexander Hubbard*, examined by Mr. RICHARDS.

I am clerk to the Ramsgate Local Board, and have been so since 1868. When I first became connected with them, constant complaints were being made by the superintendent of the police, and also by individual members of the committee at their meetings about the public lighting. The cleaning of the lamps was frequently neglected for weeks together, and the light was sometimes not more than that of an ordinary candle. A week or two after I was appointed I sent a letter, complaining that the lights were continually being blown out, in consequence of the lamps being broken at the bottom. In 1870 the Local Board wished to fix some new public lamps in one of the promenades; but the company refused to supply the gas unless the board would provide a main. The following year the Local Board contributed £15 towards the expense, and the main was laid down. On the 3rd of June, 1873, the company gave us notice that the charge for public lamps would be raised to £5 for permanent lamps, and £4 15s. for non-permanent lamps. We endeavoured to obtain a lower rate, but the company would not abate the charge, though they suggested the average meter system. They threatened to discontinue the lighting if we did not pay the £5, and we were completely under their thumbs. In October, 1873, the board applied to the company for abstracts of their accounts, but the company declined to supply them. About June 24, 1874, the board resolved to discontinue lighting one-half the number of public lamps; but as that affected the comfort of everybody, in September they were obliged to light them all again. In January, 1875, the average meter system was introduced. In October of that year a committee was appointed to negotiate with the gas company for the purchase of their works, and a considerable correspondence took place on the subject. [A great number of letters were then put in, and read.] Similar letters passed between the board and the water company. I believe several of the directors of the water company are also directors of the gas company. The complaints as to the supply of water have been principally with regard to the quantity of water; but there have been occasional complaints about the quality.

Cross-examined by Mr. POPE: The board have not interfered or passed a resolution since 1869 about the lamps being broken at the bottom, but constant dissatisfaction has been expressed at the board. It was arranged between the surveyor and the gas company's manager that when the lamps were accidentally blown out, twopence per night was to be allowed by the company. I am not aware of any agreement with the gas company that they were not to be called on at their own expense to lay down more than 50 yards of main. The only agreement I was aware of was as to the price to be charged for the public lamps. I did not understand that from year to year the agreement was renewed. Our offer of £4 5s. 6d. per lamp was on the basis of 4s. 6d. per 1000 feet for the gas. The opinion of the board was that 5s. per 1000 was not a reasonable sum for a town like Ramsgate at the then price of coal. The average meter indication system effected a saving; but we burn less than we did before, and only consume 4 feet per hour, which works out the £3 7s. 10d. The board still consider that the price of gas is too high. Since the agitation it has been reduced to 4s. In June, 1874, we felt that we were in the power of the gas company, and thought that we would try and prove that the light which they supplied was not according to the requirements of their Act, and we attempted to light with oil, in order to have a certain hold on the company, and see if we could light cheaper than with gas. The company have been encouraging us to go on with the negotiations when they ought courteously to have replied that they would not accept our offer. The people in Ramsgate are very sore about the breaking up of the streets, which are most of them exceedingly narrow, and any breaking up leads to danger. If the Local Board have the control, they would do it with a little more care as to the time. Directly a house is unoccupied the company send a man with a pickaxe to make an excavation in the roadway, and perhaps in a fortnight's time the house becomes occupied again, and then they have to make another excavation. I do not remember any date that a complaint was made by the Local Board to the water company as to the quality of the water. After we complained about the supply running short between Saturday and Monday, a Sunday supply was put on. The company did not turn it on on the Sunday until we sent them in the report of the medical officer of health. The Public Health Act gives the Local Board power, as the sanitary authority, to compel the company to give a proper supply of water, and if they do not give it, to build their own works. It was noised about the town that we should do so, and that remedy still exists. We could compel the water company to give a sufficient supply; but we object to pay them 7 or 10 per cent. upon the amount to be invested in the works. If we were to serve them with notice to give us a constant supply, it would be necessary for them to raise fresh capital, and under the Water-Works Clauses Act they would be able to get 10 per cent. on the outlay.

Re-examined by Mr. RICHARDS: The dividends of the company are not limited in any way to 10 per cent. By the bill which they have just withdrawn, they proposed to pay 10 per cent. upon the capital which they wished to raise. The Local Board did not think that the company should receive 10 per cent. upon new capital, when they could get money at 4½ per cent., and build additional works themselves. In the existing state of things every increase in the works and plant of the gas company is necessarily made out of profit, for they have no power to raise capital. We think it desirable to put a stop to that. Under the present law, we could, after giving notice to the company to provide a proper supply of water, put up water-works of our own, if they failed to do so; but our notice to them would be practically giving them a large

bonus, for they would necessarily have to raise further capital, and, of course, they would charge an amount sufficient to pay the full statutory dividend.

By the COMMITTEE: The gas company have to pay 2s. a ton to the Local Board on all the coal they use. In Margate, I think it is 3s. a ton. I believe the companies lodged their bills at the same time that we lodged ours. We did not know that they were going to Parliament. I was always under the impression that they lodged their bills in consequence of our bill.

Mr. *John Barnet Hodgson*, examined by Mr. O'HARA.

I am the postmaster of Ramsgate, and have resided there for 34 years. I have been postmaster for more than 30 years, and a member of the Local Board several times. Privately and officially I am a considerable consumer of gas, and have had reason frequently to complain of its quality and the deficiency of pressure. I have gone to the gas-works about it on several occasions. About two or three years ago, a change took place in the main opposite the post-office, and the result was that a greater number of feet were consumed, without any increase of light. I found that my neighbours experience was the same. I consider the price now charged is too high, and that is the general feeling throughout the town. The lighting of the public lamps in the neighbourhood of my house has been very unsatisfactory. There were several meetings on the subject of the gas supply in the months of August, November, and December, 1874. In 1874 the company charged 5s. per 1000 feet. Numerous complaints were made, and the price was reduced to 4s. 6d. The impression in the town was very general that the high price was maintained much longer than it ought to have been. I hold shares in the gas company as a trustee for an infant. The company have been paying £3 per year on each share. I think it desirable that the gas-works should be subject to the control of the Local Board. I have found the water supply quite the reverse of sufficient. It is only on for about an hour and a half a day, and in some parts of the town even then the pressure is not what it should be. In some of my property I know we have had great difficulty in getting a supply. In addition to that, there are no provisions in the Act compelling the putting up of cisterns through the town, and there are many houses without them. I have known several instances of cisterns not being filled with the present intermittent supply. I am a director of the Isle of Thanet Steam Flour Mills Company, doing business at St. Lawrence. The water company supplied them for some years, but not with sufficient for their requirements, and they were consequently obliged to dig a well for themselves. Great public inconvenience is felt from the practice of the gas and water companies breaking up the streets so frequently, and in two or three instances great difficulty has been experienced in getting a supply of water when fires have broken out. I recollect one house being burnt down entirely before water could be obtained.

Cross-examined by Mr. MICHAEL: In case of fire, when the water is obtained the pressure, is sufficient. It is proposed by the bill to have a constant supply, but I do not know whether it is to be from the present works.

Mr. MICHAEL: Do you know, supposing the Local Board acquired these works, that the pressure under which the Local Board intend to supply water in Ramsgate is exactly the same pressure as that which is now given by the water company?

Sir E. BECKETT: He cannot know that.

Witness: It depends on future action. When once we get rid of the company we can make what improvement you like.

Mr. MICHAEL: We can make improvement too.

Sir E. BECKETT: You cannot.

Cross-examination continued: I believe, up to this time, the company would not allow a service-pipe exceeding three-fourths of an inch, and that is not sufficient. In one case a 1¼-inch pipe was found to be necessary, and a fresh supply was then obtained, but it was contrary to the regulations of the company. The manager of the flour mills company complained about the insufficient supply, and for a time they met us by putting on a service-pipe from the main. I do not know what the regulations in the present bill are, with respect to a supply of water for manufacturing purposes; but I should think the Local Board, if they acquired the works, would be happy to supply a manufactory with as much water as might be required. I consider 4s. per 1000 feet too much to charge for gas at Ramsgate, even though the price in London is 3s. 9d.

Re-examined by Sir E. BECKETT: Coal is cheaper at Ramsgate than in London.

WEDNESDAY, MARCH 15.

Mr. *Moses Jackson*, a nineteen years resident in Ramsgate, and member of the Local Board, said that on Nov. 17, 1874, he presided over a public meeting in the town, convened by requisition, and a resolution was passed that gas ought to be supplied at 3s. per 1000 feet instead of 5s. The resolution was forwarded to the gas company, with a letter, asking if they would consent to sell their property to the local authority, and, if so, on what terms. A reply was received, stating that no decision could be arrived at by the directors without the consent of the shareholders. On the 2nd of December another public meeting was held, and a resolution passed asking the directors to call a meeting of the shareholders to consider the point. In reply the directors refused to do so. On Jan. 5, 1875, a third meeting was held, and it was resolved to send to the Local Board only such men as were prepared to vote for the transfer of the gas to the local authorities. At the following election of commissioners, nine out of eleven were in favour of the transfer. The gas supplied was very bad in quality, and the pressure insufficient. About Christmas the company laid a larger main along the Royal Road, but the result was that the supply to witness's house was worse than before. He had to use candles for the last few weeks of the year, and he complained to the chairman of the company. In the summer time he had constantly to complain of the insufficient supply of water. His cisterns were sometimes only partly filled, and sometimes not supplied at all. In his opinion it was desirable that the control of the gas and water supply should be transferred to the local authority.

Mr. *E. J. Hobbs* said he was a draper, and had resided in Ramsgate about 19 years. Had frequently complained to the men who examined the meter of the gas supply as bad in quality and insufficient in quantity. On one occasion he had sent a written complaint to the company. He considered the price extremely high. The agitation on the subject commenced in July, 1874.

Mr. MICHAEL said he admitted there had been a public meeting and a requisition.

Examination continued: The requisition was signed by 200 gas consumers. He attempted to inquire into the mode in which the company conducted their business, but was treated with contempt, and could get no reply.

Mr. *George Hill*, landlord of the "Bellevue" Hotel at Pegwell Bay, and one of the overseers of the parish of St. Lawrence, said that for the last two years he had scarcely any gas in the hotel, and the lights frequently went out. Early in the afternoon the gas might be pretty good; but when the town was lighted it diminished. About three weeks or a month ago a great improvement took place. He wanted to erect a gas-cooking apparatus, but the pressure was insufficient. The visitors complained of the small illuminating power of the gas, and required a candle or two in addition to read by. For the last three weeks the gas had been better in every respect. The public lamps in St. Lawrence would go out at the same time as the lights in his own house. The lamp-glasses were kept very dirty. He regarded the price charged as higher than it ought to be. There was some difficulty in obtaining gas for new public lamps. There was a general feeling in the town in favour of the control being in the hands of the local authorities. His hotel was not far from the water-works, but the supply was on for an hour to an hour and a half daily. He had had to have two new cisterns erected because the supply ran short on Sundays. It was sometimes brackish, and at other times milky. He had always advocated that the water and gas should be in the hands of the local authorities, and that was the general feeling of the inhabitants.

Cross-examined by Mr. MICHAEL: Pegwell Bay was outside the district of the Ramsgate Local Board. It would be for the advantage of the Ramsgate people to charge as low a rate as possible. Three months ago some new pipes were put down for about a quarter of a mile along the Pegwell Road, and since then his supply had been better. He did not know how long the company had contemplated laying down those pipes, but he complained to them two years ago.

By Mr. RICHARDS: There was nothing in the bill to enable the Local Board to charge a differential rate, and it was contemplated to increase the district under the Local Board.

Mr. *H. G. Hayward*, a surveyor, residing at Southwood, said his house was about 30 yards from the entrance to the water-works. The dimension of the reservoir was 100 feet by 70 feet by 15 feet; or capable of holding 650,000 gallons. About 1866 the company added another engine to their works at Southwood, and since then the wells which were formerly used had, in many cases, been converted into cesspools. The effect upon the wells of the pumping into the reservoir was partially to drain them. The Southwood water was not so good as that from Whitehall. It was not used, he believed, by the railways. The supply was irregular and insufficient. He was one of the lighting inspectors of St. Lawrence. He complained last January to the inspectors that the lamp near his door had not been lighted for three nights. The same thing had occurred with other lamps. Last winter the cleaning of the lamps was very much neglected.

Cross-examined by Mr. MICHAEL: He did not know that the lamplighter was discharged for not lighting the lamps near his door. Had told Mr. Banks that the sewage matter from the cesspools drained into the reservoir at Southwood. That happened about ten years ago, when the wells were shut up and converted into cesspools. The wells had never been filled up; merely domed over. The level of the wells was about 150 feet. Did not know what the level of the top water in the pumps was. Since the wells were converted into cesspools, he had not seen the liquid contents of the wells drained away in consequence of any operation by the company, but drew the inference that the cesspools must drain away into the reservoir from the fact that the wells formerly were affected by the pumping.

Mr. *J. H. Etheridge*, foreman to the Ramsgate Local Board, said the water company were in the habit of frequently breaking up the public roads. When a house was vacated, they generally broke up the road and disconnected the service, reconnecting it when a new tenant came. They usually left roads in a very bad state, and he had to repair them at the expense of the Local Board. Had been unable to have sufficient water to flush the sewers. The mains were not well laid, being too near the surface, and the company had very little knowledge of where their own mains were. The mains sometimes got broken by the road roller. Gas and water mains should never be less than 1 foot 10 inches beneath the surface.

Cross-examined by Mr. MICHAEL: He did not believe there was any agreement that the Local Board should reinstate the roads and charge the gas and water companies with the expense.

Mr. *Edward Ellice-Clark*, examined by Mr. RICHARDS.

I am a civil engineer and surveyor to the borough of Derby. In January, 1872, I was appointed assistant-surveyor to the Local Board of Ramsgate. Immediately after my appointment I found a deficiency in the water supply, and called the attention of the Sanitary Committee to it. In January, 1873, I was appointed surveyor of the town, and in June of that year I again called the attention of the Sanitary Committee to the deficient supply of water. The supply was very small in the courts; in very few of them were there any cisterns. Most of the smaller houses in the town were connected with the sewers, and were in a great state of insanitation previous to my being appointed surveyor. They were connected under the previous surveyor, who was a director of the water company, and in nine cases out of ten the closets had not a supply of water of any description whatever. Some of the poorer houses had an independent water supply, but in many cases a single tap served for several houses, without any cistern. In Newcastle Hill, in Ratcliff Cottages, and other places, the water was on only about an hour and a quarter or an hour and a half at a time. I have seen children, especially in the summer, when their parents were engaged on the beach, waiting their turn to get the water while it was on, catching it in house utensils, and letting it remain there. I have seen water for house consumption in a pail in a water-closet in the town. In consequence of the scarcity of water, not only were the closets in a filthy condition, but the drains were actually choked up. This state of things prevailed largely in houses that had privies. I should say that 90 per cent. of the smaller dwellings in Ramsgate, at the time of my appointment, had no supply of water connected with the closets. At the town-hall we had a cistern holding, I should think, something like 700 gallons. It supplied the police-station, and latterly the market. I have known that cistern, at five o'clock in the evening, to be entirely empty, and the water was not turned on till the forenoon of the next day. The police office was dependent upon that cistern. There are four police cells, and I have inspected them, and found no water there, and consequently the excreta remaining in the pan. I should say that nothing could be more gross than the inattention paid by the servants of the company to the fittings of the houses. As an instance, I may mention that notice was served by the sanitary authority upon certain owners, to put a service of water to their closets, and there the duty of the sanitary authority ended, so far as the fittings were concerned. I, as a sanitary officer, had no power to superintend the fittings. The owners complied with this order by putting up a tar-barrel and pewter taps. The winter followed, and I remember going to the houses, and finding, as I believe is the case at this very hour, every tap broken with the frost, and the water diverted, in one instance, into a tub for the people's use, but none having water for the closets, as was intended by the order of the sanitary authority. In one case my attention had been called to some dilapidated cottages as being in an insecure state. I saw there a screw-down tap running, but I did not take much notice of it at the time. About a month afterwards I looked at the place again, and the tap was still running. About three days afterwards I was there, and found the water was not running; but the tap was turned on, so that if there had been any water it would have been wasted. Many complaints were made with regard to the connexions of the sewers and the closets with the mains. I remember that water was put on from King Street to a large cistern at the upper end of Ratcliff Square. About a week afterwards one of the persons in the houses came to me and said that they were drawing the stuff out of the closet-pans. I went and found that the pipe which connected the water with the sinks for domestic purposes, also connected it with the closet-pans, which were on a higher level than the kitchen. The pans in the closets had become full, and the cistern at the top end of the court being empty, the people were drawing into the kitchens below the contents of the closet-pan. I had one or two meetings with the chairman of the company and their foreman about it, and, therefore, I know that they must have been aware of it. With regard to the gas-work, I know that there is a considerable connexion between the gas company and the water company, so far as the directors are concerned. I do not know that I have ever found the gas getting into the water-mains; but upon one occasion, within the last six months, a child came to the office of the Local Board with a cup filled with what she called tar-water. I went with the child, and found that in Hardres Street the people were drawing what was really ammoniacal liquor from the water-mains; and the turncock, in my presence, emptied the mains. I think the charge of 1s. per 1000 gallons for water for

public purposes is too high. I have specially gone into the figures, and am strongly of opinion that it could well be supplied to the sanitary authority at 9d. per 1000 gallons, and that would leave the company a good margin of profit. Flushing the sewers is very essential at Ramsgate, from the nature of the soil; in fact, the sewerage system of Ramsgate, and of all towns upon chalk, must of necessity break down, unless there is constant flushing. The chalk is so absorbent, and the rainfall so partial, that you must have an artificial flushing to create a flow in the sewers. In August, 1874, I made a report to the sanitary authority in consequence of the insufficient flushing. I told them that unless there was more water used, the sewerage system would break down, as the sewers would silt up. If all the smaller houses had water connected with the closets, less flushing would be required. I know of a sewer with a very steep gradient in Newcastle Hill, which was entirely silted up, and had to be opened and cleared by scavengers, but if the sewers had been properly flushed at the commencement, that never could have occurred. The inconvenience of breaking up the ground in Ramsgate is at all times, and with the best arrangements, very serious; but where, as in the case of the water company, they disconnect every house at the time of a tenant leaving, and reconnect it when the house is retenanted, the inconvenience is still greater. It ought to be done with a small stopcock close to the kerb. The same thing is done to a more limited extent by the gas company. The ordinary way of cutting off gas is to cap it at the service, and not cut it off at the main. In my judgment, all these difficulties would be materially obviated if the whole thing were under the control of the Local Board. Within the past twelve months I made application to the company for a reduction in the price of water, but they refused the application. To my certain knowledge, in many of the streets the mains cross from one side of the road to the other. The gas-mains cross the water-mains, and the water-mains are close to the surface of the street. I do not think that any water-mains ought to be laid less than 2 feet 6 inches from the surface. I have seen the two pumping stations, and should say they could raise about 750,000 gallons in ten hours. I think there should be at least one million gallons per day supplied in July, August, and September. That would be taking it at 20 gallons per head, which is certainly the minimum quantity that should be given. The summer population is about 50,000. I think the engine power is about equal to 750,000 gallons; but I do not think they in fact pump that. The Southwood reservoir is capable of holding about 640 million gallons, but that is very much less than the capacity ought to be. In St. Lawrence a similar deficiency prevails as in Ramsgate. With regard to the public lighting, at the time of my appointment as assistant-surveyor I think it was very unsatisfactory. The charge at that time was £3 10s. per annum for permanent lamps, and £3 1s. for lamps that were not lighted on moonlight nights. In June, 1873, the company required an advance in the price to £5 for permanents. I endeavoured to ascertain what was the fair increase per lamp which ought to pay the company well, and the conclusion I arrived at was that about 10s. additional per lamp was sufficient. I have never tested the pressure as an engineer, but in the house where I lived it was certainly slack. When I first went to Ramsgate there was a deficiency in the light in the rooms, but it improved during my residence there. I left in November last. The gas even then was of a low illuminating power.

Mr. RICHARDS: We have heard that the town got into such a condition that it was determined to use oil or petroleum.

Witness: I conducted the experiment, and we had Effingham Street lighted with lamps. At the time I did that, there was a very strong feeling of dissatisfaction about the gas. The feeling was so strong, in my opinion, that if we could have lighted the town with oil thoroughly, at anything like the cost of gas, we should have done so. The expense of lighting, at the time I was in Ramsgate, amounted to £1140 a year; but if we objected to the price, we had no alternative but either to light the town with oil, or to remain in darkness. We afterwards adopted the average meter system, and made a reduction in the consumption by reducing the size of each burner. The commissioners based their rate, during the negotiations, upon the former charge made by the gas company. When, therefore, the gas company raised their price, the rate levied was insufficient to meet the charge, and the commissioners had to put out about half the lamps in the town for about three months.

Cross-examined by Mr. MICHAEL: We had unlimited powers of rating at Ramsgate for sanitary purposes. If we had expended more than the rate, we had six months within which to make a new rate, in order to cover any deficiency. The population of Ramsgate is about 16,000, and the inhabitants live in about 2880 houses, but I have never enumerated them. The total number of inhabitants in Ramsgate and St. Lawrence is about 20,000. I do not know the number of cottages in Ramsgate supplied by the water company at 6s. a year, but there is a large number of such cottages. The Local Board were enforcing the supply of water, under the Public Health Act of 1848, to those cottages when I was there, but they had not done so previously. When I left, a large number of the poorer class of houses were still unsupplied with water. The Local Board had also power to enforce water-closets, and we served a notice for that purpose; but our powers would not go so far as to see that the apparatus put up was proper, and connected in a proper manner. Most of the houses that were connected after I was surveyor were connected in a proper way, but previously they were not connected with the water supply. If the supply of water passed into the hands of the Local Board, they would have greater powers than they now possess for enforcing proper arrangements for the houses, and they would have a constant supply of water; but I do not think they would have any more power to enforce the water supply for closets upon the owners of poor property.

Mr. MICHAEL: Do you wish the committee to understand that what is called "hand-flushing" in water-closets is to be deprecated?

Witness: I do deprecate hand-flushing most strongly in a town upon the chalk.

Mr. MICHAEL: What difference can it make whether the supply of water comes in by a pipe, or by a flush from a cistern, or from a pail?

Witness: The poorer class of people will not go to the trouble of taking a pail, and throwing water down the closet.

Mr. MICHAEL: Upon what do you base that opinion? Because I have here a report by the Government officer, Mr. Pole, who investigated that question for the Government, that this is the very thing that poor people will do.

Witness: I will venture to say if Mr. Pole had visited a town like Ramsgate, which is upon the chalk, he would have been exactly of my opinion; for in Ramsgate the people would not, and did not, flush them with a pail.

Mr. MICHAEL: Will you tell the committee what difference it can possibly make, whether it is chalk or any other soil?

Witness: By hand-flushing I do not think you would get so much water, because there is a large amount of trouble necessitated. Persons have to go to the tap and draw it, and then go down to the closets, which are frequently at the ends of the yards, and pour it down; and if you had adopted the hand-flushing system in Ramsgate, you could only have flushed at the time that the water was on. When there was an intermittent supply, the people would not be able to go at all times to the taps, and get water to flush the closets with.

Mr. MICHAEL: But what can be the difference between a chalk soil and an other soil as to flushing the closets?

Witness: You want to get a larger amount of water in the sewer on the chalk soil.

Mr. MICHAEL: But what difference can that make in flushing the closets?

Witness: By flushing from a cistern you get a larger amount of water in the closet than by flushing by hand.

Mr. MICHAEL: Is the quantity of water of any value whatever, unless it goes down in a flush at one time? Is a dribbling supply of water through a pipe of any value for flushing the sewers?

Witness: Most certainly. The town of Ramsgate has very steep gradients, and what is required in a sewer is a constant flow of water, and not an intermittent one.

Cross-examination continued: I had some correspondence about making an arrangement that in future I, as representing the Local Board, should repair the roads when they had been taken up by either of the companies, and that they should pay the expense. Since that time I have repaired the roads, and the repair has been paid for in the case of the gas company, but not in the case of the water company. The agreement with the water company was never carried out. We have repaired the roads for the gas company; but the rule has been for the water company to repair the roads themselves. I cannot tell how many times in the course of a year the water company cut off the supply from houses previously supplied by them; but I should think it was more than six times. I do not think I ever made a demand on the water company for a supply of water for sanitary purposes, without such a supply being afforded. [Witness then explained why he thought, in the instance he had mentioned in examination, the sewage from the pan flowed down from the pipe where the inhabitants were endeavouring to obtain water.]

Mr. *James William Barry*, examined by Mr. RICHARDS, said he was medical, officer of health for Ramsgate, where he had resided all his lifetime. He considered the water [supply dangerously inadequate for the wants of the people, especially in the case of small houses. The supply was generally deficient and the pressure also. He had made frequent reports to the Local Board, both verbally and in writing, on the subject. At one period there was no supply turned on on a Sunday, but within the last two years there had been such a supply. Close upon twelve months elapsed between his first report to the board on the subject (which report was sent to the water company) and the conceding of the Sunday supply. He knew districts that only had a water supply for about half an hour a day; and, in his judgment, the public health was exposed to very great risk in consequence. He had received several complaints about the condition of the sewers, on account of the difficulty in getting water to flush them, and he had frequently called attention to the inadequate supply. He considered that the business of the water company should pass into the hands of the Local Board.

Cross-examined by Mr. MICHAEL: The houses he inspected were especially those inhabited by the poorer classes. The population, taken as a whole, was a very poor one, but he did not think there were 1000 houses which were supplied under the twopence a week clause. He considered there would only be between 500 and 600. A large proportion of the houses in St. Lawrence were of that class, but that was out of his district. The proportion of the poorer houses in St. Lawrence was greater than in Ramsgate. He considered it of primary importance that these houses should have a good supply of water. The compulsory powers had been applied to about 100 cases. When water-closets had been established, it was scarcely his duty to visit the premises, and see whether they were connected and in proper condition. The inspector of nuisances would report to him, and therefore, of course, if the places were not connected and in a sanitary condition, it was because the provisions of the Sanitary Act had not been enforced. The mortality in Ramsgate was from 12 to 15 and sometimes 18 per 1000. Ramsgate ranked pre-eminent for healthiness, but that was due to nature.

Mr. RICHARDS: Despite the gas company and the water company?

Witness: Yes.

Mr. RICHARDS: Then it must be a very healthy place by nature.

By the CHAIRMAN: In the report for the death-rate I eliminate those who are merely visitors.

Dr. *Robinson*, medical officer of the East Kent combination district, examined by Mr. RICHARDS, said, before he settled in Kent he was officer of health at Leeds for six years, and had had experience of the water supply of that town, where the works were in the hands of the corporation. In his opinion, it was an advantage to have the supply of a town under the control of the local authority. He had had occasion to complain of the quality of the water at Ramsgate, where the cisterns performed the double function of serving the water-closet and the ordinary supply of the household. In consequence of the fear that they would not have an ample supply of water, drainage works were, for the present, out of the question; and the district which was occupied by the poorest population depended for its drainage upon the cesspools entirely. It would be an advantage to the Rural Sanitary Authority to have water supplied to them for public works. The village of Minster was within the area of the projected supply, and at present obtained water from private wells, which, in the majority of instances, were polluted. He believed the company had power to supply Minster, but they had not done so.

Cross-examined by Mr. MICHAEL: He believed the power asked for in the bill to supply Minster was merely permissive to Minster, which was without the jurisdiction of the Ramsgate Local Board; but, if the board showed that they could supply the external district with water and the means of effectual drainage, the Local Board would probably allow an extension of the district.

Mr. *C. Pearce*, a member of the Local Board at Ramsgate, and owner of some property at St. Lawrence, said his tenants had frequently complained to him about the supply of gas. The feeling at Ramsgate was very strongly in favour of the bill. A petition from Minster was also presented in its support.

Mr. *Thomas Knox*, a mechanical engineer at Ramsgate, and owner of the Clarence Baths, said he was well acquainted with the engines at Whitehall. They could pump about 900 gallons per minute, ten hours a day. They could not pump more than ten hours, because there would be no water. The Southwood engine pumped about twice a week. The water was very salt, but the Whitehall water was good.

By Mr. POPE: He did not know what the yield of the wells was. He got the information about the number of hours the pumps would work from the man who drove the engine.

Mr. *J. Veale*, station-master at Ramsgate, said the supply of gas at the station was bad. Had spoken on various occasions to the gas inspector about it, and in July, 1871, he complained to the gas company.

By Mr. POPE: Had never complained to the gas company since.

Mr. *George Wilson Stevenson*, examined by Mr. O'HARA.

I am adviser in engineering and gas matters to the Corporation of London, and to many different gas companies and local boards. I was consulted in October last by the Local Board of Ramsgate, with reference to the gas and water supply to the town. I knew Ramsgate pretty well before, and I have known that dissatisfaction has existed there and at Margate, in consequence of the high price and the insufficient supply of gas, and from the fact that the company are not under parliamentary control. I do not know of any other company in England working under so old an Act without any amendment. The stated population of Ramsgate is about 15,000; of St. Lawrence, about 5000; of Minster, about 1800; altogether, about 22,000. The constitutions of the gas and the water companies are pretty much the same. They have the same chairman, and certainly their policy in avoiding coming to Parliament has been identical. Both of them have for many years past exhausted their statutory powers with regard to capital, but instead of coming to Parliament and getting fresh capital, and putting themselves under parliamentary control, they have kept up the prices of gas and water, and in that way have obtained from the consumers the means with which to extend their works. Instead of the works being paid for out of the capital of the companies, they have been paid for by the consumers. The works that supply Ramsgate and Margate are totally distinct, both as to manufacture and distribution. Origi-

nally the capital the company were empowered to raise was £24,000, but they allege in the bill, which they lodged, that they have expended £48,000, in addition to the £24,000 of authorized capital. The chairman of the gas-works very courteously allowed me to view the works. I made an experiment of the illuminating power on a subsequent occasion, I think in the second week in January, and found that in the evening it was 13·3 candles, when burnt at the rate of 5 feet per hour. On the following day it was only 11 candles. The sulphur was 18 grains in 100 feet, and there were 8·3 grains of ammonia. The pressure was so exceedingly small that I had great difficulty in getting 5 feet of gas per hour through the burner when making the experiment. The sulphur test was left all night, and the gas went out, so that the test had to be repeated on the following day. The price for gas at the present moment is considerably higher than is necessary to enable the company to pay 10 per cent. upon that portion of their authorized capital which is due to the Ramsgate works. Their authorized capital is £24,000, and if one-half is due to Ramsgate, and one-half to Margate, the company would be entitled, if they were limited to 10 per cent. upon the £12,000, to a dividend of £1200 a year, and they could pay that dividend and all their working and management expenses, for 3s. per 1000 feet, while they are now charging 4s. The maximum price in their bill was 5s. 6d. It was a hard and fast line, with no sliding scale for variation in the price of coal.

Mr. O'Hara: Suppose for a moment that the works were the property of the Local Board, have you made any calculation as to whether or not the Local Board would be able to supply the gas at a lower rate than the company now supply it?

Mr. Pope: That depends on what our works are worth.

Mr. O'Hara (to witness): What can gas be manufactured for at Ramsgate?

Witness: It may be delivered at the consumer's meter for 2s. 6d. per 1000 feet. Of course, that is not including dividend.

The Chairman: Are you taking into consideration the rate on coal of 2s. per ton at Ramsgate?

Witness: Yes; I am dealing with the matter as the company would have to do, for the sake of comparison. The coal free on board in the Tyne would be 9s. per ton; freight, 7s.; town and harbour dues and haulage, &c., 4s.; making the cost of coal at Ramsgate 20s. per ton, which I think is rather lower than the present rate. Then I assume that the Local Board would sell a minimum of 8700 feet per ton of coal. I do not know what the company sell, but I am quite sure the Local Board would sell that, and I take an annual sale of 45 million feet. Then I want to ascertain what they would get for the residual products, and so arrive at the net cost of the raw material. A ton of coal produces a chaldron of coke—that is, 36 bushels. I deduct from the 36 bushels, 12 bushels used for fuel in carbonizing the coal—that is, 33 per cent.—and it leaves 24 bushels for sale. Then I have to deduct 24 bushels of coke at 10s. per chaldron, which is 6s. 8d., and the tar and liquor 3s. 6d. per ton carbonized—that is, 10s. 2d. to deduct from 20s., leaving the net cost of the raw material 9s. 6d. per ton. Then I add all the charges of management, manufacture, repairs, rates and taxes, and so on, 12s. per ton, making the cost of 8700 feet of gas sold 21s. 10d., and that works out at exactly 2s. 6d. per 1000 feet.

Mr. O'Hara: How much per 1000 cubic feet would pay 10 per cent. on £12,000?

Mr. Pope: But they cannot make 50 million feet with £12,000 capital.

Witness: Sixpence per 1000 cubic feet would pay 10 per cent. on £12,000, so that a selling price of 3s. would pay the company 10 per cent. upon their authorized capital. I have taken £45,000 as the sum which probably the Local Board might be called upon to pay for the works at Ramsgate.

Mr. Pope objected that this evidence might be very relevant to the general question of whether, by agreement, the local authority might be reasonably entrusted by Parliament with the control of the gas; but it was not relevant to the inquiry, whether the local authority should be authorized compulsorily to buy the company.

The Chairman said the committee felt that an engineer was at liberty to do any sums he liked in their presence; but it would not be assumed in any way that any particular sum mentioned represented the value.

Witness: Assuming that the Local Board had a capital of £45,000 in these gas-works, they could borrow the money, and repay principal and interest spread over 50 years, and all working expenses and all charges of whatever kind, and sell gas, without loss, at 3s. 6d. per 1000 feet.

The Chairman: That is assuming a constant price for coal.

Witness: The present price.

Mr. Pope: We do not need any elaborate calculation to prove that borrowing money at 4 per cent. is cheaper than borrowing money at 10 per cent.

Examination continued: I inspected the works of the water company. They are not sufficient to supply the present population. The pumping power at Whitehall is 45-horse power, and I take it that the Southwood works ought not to be used at all, because the water is brackish and suspicious, if not absolutely bad. The supply coming altogether from Whitehall, the engine power there necessary to raise 20 gallons per head per day of ten hours for 50,000 people, ought to be equal to 85-horse power. Then there is this to be considered—that if a company go on pumping with insufficient power, and without the means of duplicating the supply when a break-down occurs, the district is liable to be without water, and such is the case at Ramsgate. The district might be without water at any time. My view is, that the water supply of a town ought certainly to be in the hands of the local authority, and I could mention a great number of places where it is so. The Rotherham case was a case of compulsory purchase. The company had a bill in Parliament, and the Local Board had one; but the company's bill was thrown out, and the Local Board's bill was passed, although it was opposed in both Houses. That was in 1870. It was not on all fours with the present case, because the Rotherham Gas Company had been in Parliament recently, and they were in Parliament then, for more capital; but it was shown that they had not fulfilled their public obligations, and had supplied very bad gas. The local authority in that case obtained power to purchase compulsorily. The price proposed in the present bill to be charged at Ramsgate for gas and water is, I think, fair in both instances. The arrangement is, that when coal does not exceed 20s. per ton, the price of gas shall not exceed 4s. per 1000; when the cost of coal exceeds 20s., and is not 25s. per ton, the price of gas shall not exceed 4s. 6d. per 1000; and when the price of coal exceeds 25s. per ton, the price of gas shall not exceed 5s.; and I think that a fair way of regulating the price. The prices for water are also, I think, reasonable. This bill differs from many other bills promoted by local authorities, in the appropriation of any profits that may be made by the undertaking. One half of the profits is to go to reduction of price, and the other half to improvements. That arrangement gives the consumers, as well as the ratepayers, a direct interest in the concern.

Cross-examined by Mr. Pope: The capital necessary to produce and sell 50 million cubic feet of gas depends upon whether the works are recently constructed, or whether they are old works. If they were all constructed at one time, I should say £500 per million feet.

Mr. Pope: Taking the works as having been developed, as is commonly the case, would you feel astonished to find that what you reckon as £45,000, is the capital employed in the production and sale of 50 million cubic feet of gas?

Witness: Yes, I should think it very much too much.

Mr. Pope: How much per million cubic feet of gas does it cost the Chartered Company?

Witness: You instance the very worst company. I will take the South Metropolitan if you like.

Mr. Pope: That is the best.

Witness: It is one of the best. I will take the Ratcliff, or the Commercial, or the Independent; but I will not take the worst.

Mr. Pope: I am told £700 per million would be a fair calculation, taking all contingencies into account.

Witness: That will be a large calculation. I was going to say from £600 to £650. Suppose if I were to start now, I would not give a bit beyond £500 per million. It is more costly to construct works gradually during 40 or 50 years, than to start new ones, unless a sinking-fund has been set aside; but if you keep destroying works, and replacing them with modern ones, and keep adding capital to capital, as the Chartered Company have done, you get an exaggerated capital, and you ought to put a large portion of that to renewals, and so keep your capital down. If, instead of doing as the Ramsgate Company have done, they had come to Parliament to raise capital for their extension, the price of gas must have included the parliamentary dividend upon the capital. I am certain that the £45,000 is not invested in the works.

Re-examined by Mr. O'Hara: The average amount of capital expended by the London companies per 1000 cubic feet is, I think, about 16s. If companies do not come to Parliament to increase their capital, the result to the consumer is, that he has to pay a higher price than he otherwise would, in order to supply the company with funds to go on; in fact, he supplies the company with capital instead of interest.

Mr. *Alfred Penny*, examined by Mr. O'Hara.

I am a civil engineer, carrying on business in Abingdon Street, and am lessee of gas-works in England and abroad. I visited Ramsgate, and examined the district with a view to this inquiry. I am acquainted with the provisions of the bill promoted by the Local Board, as well as the bills promoted by the gas and water companies. Under the circumstances of Ramsgate, in my judgment it is desirable that the control of the gas and water in Ramsgate should be entrusted to the Local Board. The companies have allowed a vast number of years to pass away without coming to Parliament for fresh capital, so that it follows of necessity that all extensions of plant must have been made out of their profits. The price proposed to be charged by the Local Board is fair and reasonable, and would be sufficient to enable them to produce gas and repay the principal and interest of the money they borrowed for the purchase of the works. I think the gas can be sold at 3s. per 1000 if a dividend is paid upon the capital which the companies have employed in those works. I mean by that the money that they have been authorized by Parliament to raise. I have made a calculation, that if these works were valued by an arbitrator, the Local Board would have to pay from £45,000 to £48,000 for them, and on that sum gas would be sold and delivered at about 3s. 6d. per 1000 feet. Coal can be delivered at Ramsgate at 20s. a ton at present prices. I had no opportunity of examining either the gas or water works, as I was refused admission, but I saw that the pumping-station at Southwood was surrounded by houses which drained into cesspools.

Thursday, March 16.

Mr. *George Frederick Rood*, examined by Mr. Richards, said he was a tavern-keeper at Ramsgate, a member of the Local Board, and a large consumer of gas. During the last two years he had been at considerable expense in continually increasing the size of his pipes, and would even now consume a good deal more gas if he could get it. Had wanted to put up a cooking apparatus, but had been advised not to do so, because a sufficient supply of gas could not be obtained. Latterly, up to eleven o'clock at night, the supply was pretty good, but after that time he had the greatest difficulty in getting a supply for even one light. The feeling of the town was almost unanimous in favour of the transfer to the Local Board. He had been obliged to burn oil, because he could not get sufficient light from the gas-lamps.

Mr. *Edward Buss*, examined by Mr. Richards, said he had been superintendent of the Ramsgate police force since May, 1870. Great inconvenience had been experienced from the breaking up of the streets, which occurred almost daily. He had had frequent reason to complain of the lights being bad, and they were put out too early in the morning. A very small draught was sufficient to blow the lamps out.

Mr. *Robert Paulson Spice*, examined by Mr. Richards.

I am a civil engineer, carrying on business in Parliament Street. I have been in practice upwards of 30 years, and have had very large experience in matters connected with the manufacture and distribution of gas. I have visited Ramsgate in connexion with this question, and I do not think there is any parallel case of any company going on, without reference to Parliament, from 1824 until the present time. I did not examine scientifically the quality of the gas supplied, and I saw nothing to complain of in regard to the character of the gas. With regard to the price, I assume a consumption of 46 million feet; and, if I take all the circumstances into consideration, I say the price, to pay 10 per cent. upon all the capital, would be 4s. 2d. per 1000 feet. I make the cost of gas, as delivered at the consumer's burner, 2s. 7d.; and 7d. per 1000 feet on 46 million would pay a dividend of 10 per cent. upon the company's authorized capital. If 10 per cent. is required to be paid on the £48,000 which have been spent out of surplus profits, then it would require 1s. more, bringing the selling price to 4s. 2d. per 1000 feet. There is no instance on record of 10 per cent. having been allowed upon capitalized profits. The £48,000 must have come out of an excessive charge for gas.

Mr. Richards: Inasmuch as the company have withdrawn their bill, can you suggest any mode by which the people of Ramsgate are to be relieved from this position?

Mr. Pope: You know the offer was made to your people, that if you would abandon your purchase undertaking, we would undertake to proceed with our two bills, and carry them through Parliament with whatever regulations Parliament enforced.

Mr. Richards: I am told that no such proposal was made. (To witness:) Can you suggest any possible mode by which the people of Ramsgate can be relieved from the position in which they are, except by the Local Board coming to Parliament?

Witness: I cannot; and I cannot imagine the people of any important town being exposed to such circumstances. The companies having withdrawn their bills, there is not the slightest security for their coming to Parliament again, except by the Local Board putting on pressure by coming themselves.

Examination continued: Without the authority of Parliament, the companies are not strictly at liberty to pay a shilling of dividend upon any portion of their capital, except that authorized. Sevenpence per 1000 feet profit would pay 10 per cent. upon that, and 5 per cent. upon the capital which has been so irregularly expended would require another 6d.—making 1s 1d. I have been engaged in almost all the gas and water bills before Parliament for years, one way or another, but know no case in England where the state of things is similar to that of Ramsgate. I consider that purchase upon arbitration terms is fair. There is no room for complaints. As a rule both sides have been satisfied, and the purchaser has to pay all the costs.

Mr. Richards: That is our case.

Mr. Pope then addressed the committee on behalf of the petitioners. He submitted that the bill ought to be stopped at once. It was without anything approaching precedent, and, in fact, was contrary to every parliamentary precedent, and Sir Edmund Beckett undoubtedly recognized that when he opened the case with a vigour, and almost with a violence of language, which the evidence had by no means sustained. He had asked the committee, if there were no precedent, to make one, because this case was so bad; but he (Mr. Pope) hardly thought that the committee would be prepared to do that, when it was contrary to the express decision of Parliament, and contrary to all practice that had hitherto prevailed. That which the promoters were asking

Parliament to do had never yet been done by any committee. His friend, Mr. Michael, and himself, took upon themselves the entire responsibility of advising the companies to withdraw the two bills which they had promoted, not because they desired that they should not, in a proper and legitimate manner, come under any parliamentary restriction, but because the only possible ground upon which it could be contended that Parliament had ever dealt in this hostile way with companies was where the companies themselves were asking for favours from Parliament, and Parliament had made the conferring of those favours conditional upon the acceptance of terms imposed upon them. Acting, therefore, as counsel, they had determined that, if the Local Board had insisted upon proceeding with their bill, it should be seen that the motive power which influenced them was not that the directors of the companies were unwilling to come under parliamentary restriction or regulation, but because the Local Board desired to participate in or derive some advantage from the large profits which the companies had been enabled to make. The offer was made before the bills were withdrawn, and he was instructed now to say that, if the present bill were rejected, and the Local Board intimated to the directors that what they wished was that both companies should come under parliamentary restriction and regulation, abandoning the notion of confiscating their property for the mere purpose of putting the profits into the pockets of the ratepayers, the companies were prepared to enter into any parliamentary pledge that was necessary to satisfy the committee that their bills should be proceeded with, and that the companies would endeavour to place themselves under statutory powers. Although that offer was made, the Local Board refused to consider it, and insisted upon asking Parliament *simpliciter* to grant them such compulsory powers to purchase as had never yet been granted in any like case. He ventured to say that no amount of misconduct on the part of a company in such a position, even if it were proved, would, according to parliamentary precedent, justify such a bill. In the Neath case the water company were actually proved to be supplying water impregnated with sewage matter; but Parliament refused to grant to the corporation compulsory powers against the will of the company. He repeated that under no circumstances, in any case, whatever the misconduct, even if it had been proved, had Parliament yet sanctioned compulsory purchase against the wills of the companies. He said this upon the authority of Sir Edmund Beckett himself, who had an active mind, and even during the recess afforded them the advantage of his assistance in the discussion of great public questions. In the *Times* of the 11th of January last was a letter from Sir Edmund upon the London water supply, in which he said that, however desirable it might be that the supply of water or of gas should be in the hands of the local sanitary or public authority, Parliament had never yet sanctioned the compulsory purchase of such companies. He said so also upon the authority of the great speech which Sir Edmund Beckett delivered last year before the Gas Committee, presided over by Mr. Forster, when he dissected and disposed of all the cases which had been hitherto held to be authorities in the matter. The Legislature had provided a statutory remedy for the misconduct of public companies, and had expressly decided that that remedy should not be confiscation of the property of the companies. The parliamentary remedy was competition in the hands of the local authority, not confiscation of the property. The report of Mr. Cardwell's committee on the Metropolis Gas Bill said, "However evident and however great may be the advantages of a single supply under conditions securing to the consumer all that he is entitled to as regards the quality and price of the article supplied, yet a compulsory and unconditional interference with the price already conceded to the producer is not the weapon by which Parliament is accustomed to secure the rights of the consumer; the legitimate weapon to be resorted to for that purpose is the enactment of an independent supply, and to that weapon your committee, for the reasons already stated, have been unable to resort." If the present bill were one to enable the local authority of Ramsgate to establish works of their own, it would be a legitimate argument to say, "You, the company, cannot complain of that petition or maintain your monopoly, unless you submit to the condition which Parliament imposes;" but Parliament had expressly acted upon the suggestion that the local authority had in their own hands the means of remedying the evils of any such monopoly—namely, after calling upon the company to do their duty, and meeting with a refusal, asking Parliament to enable the local authority to do it for themselves. The Public Health Act of 1875 was conclusive upon this point. In the course of last session that Act was carried through Parliament, giving very increased powers to local authorities with regard to questions of this kind, and all previous parliamentary precedents and authorities might be considered as embodied and expressed in that Act. Now, what did that Act say? Did it say that, in the event of water companies not doing their duty, the Local Boards were to come to Parliament for permission to buy those companies? Nothing of the kind. By section 51 and the following sections, Parliament enacted that it should be lawful in such cases for the local authority to construct water-works. If, therefore, the local authority were not satisfied with the supply of water, what they had to do was to call upon the company to supply water proper and sufficient for all reasonable purposes, and if the company disputed that the requirements were reasonable, the Local Board could refer the matter to arbitration, to say whether they were so or not. If the company would not then give a reasonable and proper supply, the Local Board could come to Parliament, and Parliament would give them leave to buy the company compulsorily. If, in the present case, there had been a shred of proof that the Local Board had ever made a demand upon the company for more water, and that demand had not been instantly complied with, there might have been more ground for their coming to Parliament; but he unhesitatingly said that, under such circumstances as the present, compulsory purchase had never been permitted. The Rotherham case, so far from being an authority for the present bill, was as opposed to it as it possibly could be. In that case, the Rotherham Gas Company were before Parliament with a bill of their own, and the Local Board with a bill for purchase. As introduced into Parliament, that bill was permissive. The committee of the House of Commons, presided over by Mr. Monk, decided in the following terms, as recorded in the minutes: "The chairman stated that the committee had decided that the preamble of the Rotherham Gas Company's Bill was not proved; he stated that they had decided that the preamble of the Rotherham and Kimberworth Local Board of Health Bill was proved, but that they had altered the preamble by striking out, on page 2, the words from line 22 to line 31 inclusive. He also stated that the committee were, however, of opinion that 24 years purchase of the statutory dividends of the Rotherham Gas Company should be inserted in the bill in lieu of arbitration; that more stringent clauses should be inserted with regard to gas inspection, and that the same charges should be made for the supply of gas throughout the whole district, including Rawmarsh." In the event of the Local Board not purchasing before Christmas, a most extraordinary clause was introduced, giving something like 5 per cent. more purchase-money than the company were to have if the purchase had not been so prolonged. The result was that these terms were so satisfactory to the Rotherham Gas Company, that, instead of its being a compulsory bill against the company, in the other House the gas company were positive petitioners in favour of the bill, and they petitioned against alteration because they had agreed to the bargain, and it went to the House of Lords as an agreed bill. That was an authority against the Ramsgate Local Board Bill. The mind of Parliament, as expressed in 1875, had always been that the true statutory remedy against the misconduct of companies was not confiscation, but competition.

The CHAIRMAN said the committee in that case took upon themselves the duty imposed in the present bill upon an arbitrator.

Mr. POPE said that was in 1870, and even if that case were an authority against the petitioners in the present instance, what had been done by Parliament was all summed up in a subsequent Act—namely, the Act of 1875, which was a summary of what Parliament intended should be done by Local Boards with regard to these matters. He had always understood it to be a cardinal principle of private legislation that Parliament never sanctioned a bill interfering with private property, unless public bodies showed that they had exhausted all public remedies. Public bodies must exhaust public remedies before they can have special legislation. Instead of proving that the provisions of the Act of 1875 were not sufficient for them, the Ramsgate Local Board had simply proved that they had never attempted to put those provisions in force. The Act of 1875 was, in point of fact, the consolidation of the Public Health Acts, and, as it were, repealed the others; and that Act said that the remedy for local boards, if the water companies were unable or unwilling to supply what was required, was to establish water-works of their own. How could it be said that there was any justification for the present application, and he submitted that the argument which he had already adduced should be sufficient to induce the committee to say that they would not be the first to make the precedent that was asked for—that they, the first committee sitting in 1876, would not pass a bill behind a public Act which only received Royal Assent on the 17th of August, 1875, and say that the provisions of that Act were insufficient. But, now, what were the grievances complained of. He entirely agreed that the water company and the gas company were under very old Acts of Parliament, and he would say now to the Local Board that, if what they wanted was to have the companies placed under the general regulations which affected gas companies, that point would be conceded; but if what they wanted was to sweep the companies out of existence, and put the profits into their own pockets, the companies would resist them as long as they had any existence which enabled them to do so. Here were two companies, without statutory power or control, conducting their business in such a way that the Local Board, with all desire to rake up everything that would discredit them, had not been able to prove more than might be proved against the best gas or water company existing. Neither price, nor quality, nor quantity, nor supply had ever been complained of by the local authority without being immediately remedied. What were the grievances, independent of those witnesses who had complained of such things as not having their gin vaults sufficiently lighted at night, or having the waste-pipe from their baths connected with the main?

The CHAIRMAN (to Mr. Richards): Do you contend that it is the duty of the water company to look to the fittings of baths?

Mr. POPE: I will show, by the Act of Parliament, that it is not.

Mr. RICHARDS said he understood that, under their Act, it was not their duty.

The CHAIRMAN: Do you contend still that water companies are bound to go into private houses, and are responsible for the fittings, such as the emptying of baths into the main?

Mr. RICHARDS said, in the generality of cases, they were.

The CHAIRMAN: As a general rule, is it the duty of the water companies to see the fittings in private houses, except as it concerned their own interests?

Mr. RICHARDS said, in all modern Acts, it was for the external fittings of the houses conveying the water.

Mr. POPE said, in the present instance, the complaint was not about the conveyance of the water, but about its discharge. They had been very anxious to get from Mr. Hubbard, the clerk of the Local Board, what the grievances really were, and, according to that gentleman's evidence, they were these—first, there was a complaint as regards public lighting. He said that, before 1869, there was a complaint that the gas-lamps and burners were not cleaned, and that the lamps were broken at the bottom, and the lights got blown out, but since 1869 not a single complaint about anything of the kind had ever been officially addressed by the Local Board to the gas company. From that date the whole matter had been adjusted and perfect, without any necessity for interference between the surveyor of the board and the manager of the gas company. In a place like Ramsgate, it must occasionally happen that, when there was a strong gale from the sea, incrustrations would be formed upon the lamps. Such a complaint was positively inevitable, and if this was sufficient to bring about confiscation of the company's property, it was sufficient to cause the Local Board to make official communications about it during the past seven years. The next grievance was that, in 1870, they wanted to light a public promenade, and it was necessary that a main should be constructed. The gas company objected to pay the whole expense of the main, and the Local Board refused to pay anything towards it. Ultimately the board agreed to pay £15; the main was constructed, and the promenade lighted. The third grievance was that on June 3, 1873, the price of coal having in the meantime largely increased, the company gave notice to the board that for the future they would charge £5 per lamp, consuming 5 cubic feet of gas per hour. When they suggested to the Local Board that it would be a true economy if they adopted the average meter system, so that they might really pay for what they burned, and no more, the local authority said, "No, we will give you £4 5s. 6d. No arrangement was come to, and, of course, no agreement having been made, the account was sent in at the sum which the company had given notice they would charge, but the result of the negotiation was that the Local Board, taking the advice of the company, adopted the average meter system, and as though to prove conclusively that the story about the gas being defficient in pressure or in illuminating power was worth nothing, they themselves had constructed a governor below the burner, which rendered it certain that the consumption should not exceed 4 cubic feet per hour. From that time the cost of the lamps was £3 7s. 10d., and no complaint was made, no alteration was asked for, nothing was said with regard to the lighting or pressure being insufficient. That action of the Local Board disposed absolutely of any statement as to the bad quality or insufficient pressure of the gas. If it was true that the lighting was insufficient when they had 5 cubic feet per hour, or if it was true that the pressure was so bad that they could not get 5 cubic feet, they would not have voluntarily consumed only 4 cubic feet per hour, because the pressure would be equally low in both cases. The illuminating power of the gas must, of course, be the same, unless there had been an improvement in the manufacture. Then with regard to the price charged. A parliamentary committee was not to force companies to reduce their price by confiscating their property. The next grievance was that in 1874 the Local Board were dissatisfied with the price they were paying, and they proceeded to try whether they could not coerce the gas company by lighting the town with oil, and positively that was tortured by Sir Edmund Beckett into a grievance, for he represented that the company refused to supply gas, so that the Local Board were obliged to light the town with oil. The only other grievance was that the company played fast and loose with the Local Board during the negotiations which were carried on; but because the company did not choose to give a definite answer when the Local Board were seeking to entrap them into an admission to be used against them in a parliamentary contest, was that a ground for confiscation of their property. He had gone through the letters that had passed, and he considered they were extremely businesslike on both sides. These matters constituted all the companies misconducts, the flagrant improprieties which, according to Sir Edmund Beckett, were to justify the committee in passing a bill, the like of which had never before been passed by Parliament. With regard to the increase of capital, he would have thought that, in a private undertaking, the most economical and proper way of accumulating capital was to save profits. If it were true that these profits were, in point of fact, savings over and above a large statutory dividend, some of the arguments on the other

side could easily be understood; but those who were competent to give any information upon the subject, and who had investigated the accounts, would state that the result of the investment of the surplus profits had practically been to save the consumers money, instead of injuring them. If the capital had been obtained by the authority of Parliament, and the statutory dividend had been divided upon that additional capital, the consumer would have to pay £4000 or £5000 more in the aggregate than he had had to pay for his gas. The fallacy of taking the calculation upon the authorized capital was so transparent, that it needed no answer. How could the quantity of gas sold have been produced, unless the company had had the capital wherewith to produce it? That which must be calculated was the amount of capital necessary to produce the article sold, before the price of sale could be arrived at. If the committee thought the prolongation of the inquiry was desirable, he undertook to prove to demonstration that the consumer had been benefitted rather than injured by what the gas company had done. Now, what were the complaints as to the water supply, or as to the quality of the water? The public health inspector had proved that Ramsgate was the healthiest town in the kingdom, with a death-rate of only from 12 to 15 per 1000. Was it possible it could be true the company had been supplying bad water to a community that was the healthiest in the United Kingdom? Nay, was it not perfectly certain that if there had been a short supply, the shortcoming was on the part of the Local Board, who had power to enforce a sufficient supply? The Public Health Act of 1875 did not merely give to the local authority power to deal with water-closets, and to call upon the water company to supply a sufficient quantity of water for their drains, but, by section 62, it was enacted that where, on the report of the surveyor of the local authority, it appeared to such authority that any house within their district was without a proper supply of water, under certain conditions, the local authority could give notice, in writing, to the owner, requiring him, within a time therein specified, to obtain such a supply, and to do all such works as might be necessary for that purpose. Where was the evidence that, as to quality or quantity, the water company were not able and willing to supply whatever was reasonably necessary for the purpose of sanitary or public or private consumption? No proof whatever had been advanced that they had ever been asked to do anything without having complied with it. The complaints against the water company were that in August, 1873, an application was made to them to attach the town-hall and market supply to the main, instead of to the system which the Local Board had supplied from the storeage of the water, and that an application was also made that the water should be turned on on Sundays, the fact being that the consumers had not provided sufficient storeage room and cisterns. Was it right, then, that Sir Edmund Beckett should have been instructed to put before the committee a report of the public health inspector as being a report against the quality or quantity of the Ramsgate water, and to say, in that incisive way which distinguished him, that the water had been reported against by the public health inspector. The report simply was, that the water ought to be turned on on Sundays, so that it should not run the risk of contamination by being stored in the houses. The moment that report was presented, the water was turned on on Sundays. That was the only grievance against the water company, except that which Mr. Banks suggested, and which, if it existed, was remediable. He could only wonder that a gentleman of Mr. Banks's position could consent to have such a nasty thing as a waste-pipe from his bath running into the main to supply water to other people. For himself, he could only say that, if he had discovered such a thing in his house, he should have sent for the first plumber he could find to turn the pipe into the drain, for he was not anxious that his neighbours should drink the water in which he had been disporting himself. He ventured to think that he was not exceeding his duty, and was not asking the committee to do more than they should do, when he asked them to stop the bill at once, but if they prolonged the inquiry, he should give evidence to answer even the shadowy causes of complaint which had been brought forward.

Mr. *Richard Braine*, examined by Mr. POPE, said he had been harbour-master at Ramsgate for five or six years. Before that time he was deputy harbour-master for eleven years, and during the whole period that he had been connected with the harbour, gas and water had been supplied by the petitioning companies. There were 14 lamps round the harbour, and two guide lamps. The average consumption by the 14 lamps was a little under 400,000 cubic feet a year. The number of gallons of water taken by the harbour was about 161,000 a year for the shipping. During the whole time that he had been connected with the harbour, the gas and water supplied had been ample and satisfactory, and there had been no ground for any complaint whatever.

Cross-examined by Mr. RICHARDS: There was a special main down to the harbour for water, with constant service. That main was between five and six inches in diameter. They flushed the harbour sewers with salt water. There was also a special main round the harbour for the gas, from which no other lamps were supplied.

Re-examined by Mr. POPE: That main was connected with the street-main.

Mr. *Arthur Lewis Stride*, examined by Mr. POPE, said he was engineer and general manager of the London, Tilbury, and Southend Railway. Until July last, he was one of the district engineers of the Chatham and Dover Railway, and had charge of the maintenance of the Kent Coast Branch from Sheerness to Ramsgate. The supply of gas and water to the stations was under the control of the engineers department. He had been a private consumer of gas at Ramsgate for about eleven years and a half. Margate and Ramsgate stations were both supplied from the Isle of Thanet Gas Company, and the Ramsgate station was supplied with water from the Ramsgate Water-Works. As long ago as 1863, he arranged with the water company for a supply of water to the station at a fixed price per 1000 gallons. The engines did not water at Ramsgate, because at Margate a fixed sum per annum was charged, and it did not matter there how many gallons they took. There was no difference as to priming between the water supplied at Ramsgate and that supplied at Margate; but since the second water station had been established at the Whitehall works, the Ramsgate water had been unquestionably better for the engines than the Margate water. He knew that, because, notwithstanding the stringent orders that had been given to the enginemen to get their supplies as much as possible from Margate, they took advantage of every opportunity to fill up at Ramsgate. That preference of the men for the Ramsgate water was shown from the fact that in the year before the alterations were made at Whitehall, they consumed by meter at Ramsgate only 215,000 gallons; while in the year ending September, 1874, they consumed 4,500,000. He made an application to the Ramsgate Company to get a reduction in the price, and showed his figures to the company. They at once entertained his application, and agreed to what he proposed. The men would run 30 miles to get the water at Ramsgate, and let the water out between Broadstairs and Ramsgate, in order that they might have an excuse for filling up at Ramsgate. The supply was constant and abundant. The pressure was so great that some four years ago he pulled out the whole of the leaden services and substituted iron, because he could not keep the pipes from bursting. The water was excellent in quality, abundant in quantity, and constant in pressure. The gas supplied to the Ramsgate station was quite as good as that supplied to any other station. He thought the consumption of gas at the station had been excessive, and he therefore instructed the gas inspector to put on burners so that they could not consume more than 4 feet an hour. The station-master had complained to him continually of the lights, but he had told him that they were quite sufficient, and he himself was responsible for them.

Cross-examined by Mr. RICHARDS: The station at Ramsgate was at the very lowest part of the town, and they had a constant supply of water there. Their service communicated with the main in the public road. He believed the water came almost exclusively from Whitehall, but he had no positive arrangement with the company that the supply should be exclusively from that place.

Mr. *Edward Easton*, examined by Mr. MICHAEL.

I am a civil and mechanical engineer, and a member of the Council of the Institution of Mechanical Engineers. I have had large experience in the construction and management of water-works, and have been engaged in the business in between 45 and 50 towns in the kingdom. My father designed the Ramsgate Water-Works, and he and I have acted as engineers for the company from 1835 to the present day. Since 1851, everything that has been done there has been done with my knowledge. I believe the company consisted originally almost entirely of local people. Nearly the whole of the original shareholders were people living in Ramsgate, and up to the present time that condition of things has been very little changed. The original Act enabled the company to supply the parishes of Ramsgate, St. Lawrence, St. Peter the Apostle, and Minster. If they did not supply all the districts within seven years, the powers with regard to the unsupplied districts lapsed, and consequently the company have ceased to possess the power of supplying Minster and St. Peter the Apostle. According to the Act, a well was to be sunk at the Southwood works, and my father's plan for getting water in those days was, to sink wells down to the level of low-water mark, and drive tunnels, which would have the effect of intercepting the various springs or streams of fresh water which might at any time be flowing out on to the beach. These springs are supplied with fresh water by means of the rainfall, which percolates through the whole surface of the Isle of Thanet, and finds its way into the sea through the fissures, which are generally at right angles to the sea. The tunnels are driven as nearly as possible in a parallel line with the sea coast. The fissures are almost invariably distinct the one from the other, so that when you cut one, the next, either to the N.E. or S.W., is not affected at all. By this means, we intercepted that portion of the rainfall which would have flowed into the sea. At the present time the springs of fresh water are to be seen issuing from the fissures on the coast, and the same thing is visible at Brighton, where similar works have been carried out. We had one main well at the Southwood works. After that, in consequence of the great drought in 1854 or 1855, the water being lowered for the supply of the town, we had an influx from one of those fissures of a small quantity of sea water, and then the railway companies and others found that the water was not fit for their purposes, and we had great complaints. My father, who was then advising the company, recommended the directors to go to a new place and make new works, and they did so. They went to Whitehall, where we adopted the same plan of transverse adits intercepting the fissures. At first the tunnels were comparatively short. In the year 1869, we increased them to a length of 1700 feet, and in the years 1872-3 we further increased them until they attained the length of 2687 feet. The total depth of the well is 104 feet, and the water attains a level in the well of between 12 and 15 feet, according to the season. The great advantage of this system is that, by extending the adit at any time, you tap a larger number of fissures, and so get a larger supply of water. At Dover, we did exactly the same thing for the castle. The depth of the well at Southwood is 186 feet, and the total length of adits is about 1200 feet. It is not equal on both sides. Since the influx of sea water, the company have always been very careful not to use the Southwood works more than they could possibly help. The upper water is perfectly good; but having once been inconvenienced, the directors have naturally been exceedingly chary of putting themselves into the same position again. It was simply the influx of sea water that deterred them from using the Southwood water. It was certainly never brought to my knowledge that any sewage matter had percolated into the wells in consequence of the pumping. I remember, some years ago, finding out that there were two cesspools near the Southwood works. It was thought that cesspools ought not to be so close, and the company paid to have those cesspools properly cemented. I believe they were cemented under the owner's own superintendence, and it is now impossible for any percolation to take place. Every analysis that we have ever had has shown that the water was perfectly free from any trace of contamination. The amount of capital expended by the company up to 1851 was £15,000.

Mr. RICHARDS objected to this witness being examined as to the accounts of the company, as he was not the resident engineer. He had, of course, gone to the office and obtained the information for the present occasion.

The CHAIRMAN said the committee were of opinion that witness was not the proper person to obtain information from, about the accounts.

Examination continued: In 1869 and 1870, we extended the tunnels at Whitehall in order to get more water. In 1871 and 1872, they were still further extended, and a second double-cylinder engine was put up, as we wished to have the means of confining ourselves as much as possible to the Whitehall works. The original reservoir, constructed in 1835, was an open one, and had become insufficient for the purpose of proper storeage, and I recommended the directors, in 1873, to make a larger one, and to cover it, as all such reservoirs should be covered. This was accordingly done. The level was also raised some 6 or 8 feet, in order to supply some of the cisterns around Southwood, with which we had had some trouble. For the supply of a few houses about 40 feet above that neighbourhood, we have a cast-iron tank on a higher level, with a pressure-valve, in order to give increased pressure to those houses which cannot get it by gravitation from the reservoir. For the last three years during the month of June, we have supplied an average of 392,000 gallons daily; in July, 432,000 gallons; in August, 427,000 gallons; in September, 380,000 gallons; in October, 371,000 gallons. The supply of water is turned on to most places two hours every day. The whole conduct of the engineering is in my hands, and any complaint in regard to the water would be sent to me in one shape or another. The company are authorized to charge 7½ per cent., either on the gross rental or the rateable value, whichever they may choose. Their actual charges have been for houses under £50, 1s. 1½d.; for houses between £50 and £60, 1s. 0½d.; for houses between £60 and £70, 11½d.; for houses between £70 and £80, 10½d. No extra charge is made for water-closets or baths. There are four consumers supplied by meter. The cottages are supplied at 6s. per annum, or less than 2d. per week. For a considerable period, the poorer classes of houses about King Street were supplied gratuitously, and, in 1869, standpipes were put up to supply the same districts. There are 3926 houses supplied in the united districts of Ramsgate and St. Lawrence, and about 2800 in Ramsgate alone. Out of this number, 1189 cottages are supplied at 6s. per annum; 440 houses are supplied at between 8s. and 12s. per annum. I heard the evidence with respect to the alleged default of the water company, in allowing sewage to be drained from the water-closet pan in one of the poorer cottages. The water company could not, according to my knowledge of their duties, be responsible for that state of things. The water was supplied into a cistern from our main; but we had no control afterwards. We could not in any way be responsible for what Mr. Banks told us about his bath. I sent the inspector to see it, and he has promised to have it cut off. If he does not, we must; for we cannot allow such a state of things to exist; but we cannot be responsible for such fittings. We have had no difficulty in tracing the mains belonging to the company. In consequence of an allegation in the petition, that our mains are bad, I sent a man, on Saturday and Monday last, to cut 19 holes in the different mains, and take out samples of the iron, by an apparatus which we use for drilling and cutting mains, so as to put in services under pressure. This drill, instead of wearing away the iron or cutting it away in little shreds, works round and round, and cuts a piece out. I did not tell the man particularly where to go; but I have a list of the places he went to. Some of the mains have been down since 1835, and the general character of the iron seems to me to be

as good as when it was first put down. I know that originally the pipes were all one weight and thickness. With the exception of one place, where I believe we shall, at no very distant date, have to renew a main, the result has been eminently satisfactory, and astonished me. Of course, it is not possible to have gas and water in the same streets, without having occasional crossings of the two sets of pipes, especially where the streets are so narrow and tortuous as at Ramsgate. I dare say that some of these diversions from side to side may have been caused by the anxiety to keep our pipes out of the way of the gas-pipes. I never heard of any injury occurring to the pipes from the water freezing and causing bursting. The rates proposed by this bill are considerably higher than those which we have been charging for so many years, and, in addition to the rate for water, it is proposed to charge for second water-closets and private baths on a sliding scale. The bill does not propose to give a pressure beyond that which the reservoir can give, and there is nothing in the bill to make any difference at all in the works. There are some very stringent regulations in the bill, as the promoters evidently look forward to giving a constant supply. With a proper arrangement, a constant supply requires a less quantity of water than an intermittent supply. At Manchester, where there is a constant service, the supply for all purposes is now between 16 and 18 gallons per head throughout the year. At Norwich it is only 15 or 16 gallons.

Cross-examined by Mr. RICHARDS: Manchester is not a water-closet town, and I should not call Ramsgate exactly a water-closet town.

Mr. RICHARDS: There seem to me to be closets, but no water.

Cross-examination continued: I have never supplied the company with any pipes. I am not their resident engineer, but all the drawings of the works have been made in my office, and all the specifications have been made there, by which the directors have carried out the works. Unfortunately I am not a shareholder. All water-works that have been properly carried out during the last 40 years are good things, and this is not an exception to the rule. I hardly know what a Consumers Company is. They were all local people connected with the Ramsgate Company at the beginning. The share list at that time included all the principal people in the town, representing all classes. The influx of sea water took place at Southwood between 1853 and 1854. Up to that date the entire supply of Ramsgate had been derived from Southwood. In 1855 we opened the Whitehall works, and Southwood is now virtually disused. The last time it was used to any extent was when we were driving the tunnel at Whitehall to get an increased supply of water. The supply from Whitehall is not now short. We convey the water that we store at Southwood from Whitehall. It is not the water company's duty, under the Public Health Act, to see to the waste-pipes from the houses, but they have the privilege if they like to save the waste of water under certain regulations, and to interfere very much with the internal arrangements of the houses under certain Acts, but the general law does not give power to do much in that direction.

The CHAIRMAN: Section 47 of the Public Health Act of last year would seem to throw that duty upon the local authority.

Cross-examination continued: Of course, it does not follow that the Local Board will charge their maximum rates any more than the company have done. The Local Board maximum is not much less than our maximum, because we have to add the water-closet and the bath. Under their Act, the company are not compelled to give water to water-closets, and it is very good of them to do so. There is no physical difficulty connected with the present works, irrespective of the fittings in the houses, to prevent a constant supply being given.

Mr. *Henry Curling*, examined by Mr. POPE.

I am the chairman of the Thanet Gas Company, and act as chairman of the Water Company. We have no regular chairman under the Water Act. I am a magistrate for the Isle of Thanet, and have been a shareholder in the gas company 30 years. Our original capital, as authorized by Act of Parliament, was £20,000, with power to raise an additional £4000. Our first outlay on capital account was £13,500 for works at Margate and Ramsgate, and the expense of obtaining the Act made the total £15,410 1s. 11d. The original issue was £16,000, so that we had a balance of capital of £589 18s. 1d. We issued 800 shares, £20 paid up. In September, 1847, the shareholders were credited with the remaining £5 on each share, but no call was made, nor money paid. In September, 1830, the directors, instead of recommending a larger dividend than the 5 per cent. which they were then paying, passed a resolution to spend the extra profit on the works. They continued to do so until 1847, when they decided that the profit which had accumulated should be placed in the company's capital account. From September, 1835, to September, 1847, £3024 was spent at Ramsgate station, and £2256 at Margate station, out of profit in the extension of works, and was credited to capital in 1847, when it was capitalized. In March, 1862, the directors passed a resolution, which was laid before the company's general meeting of shareholders, that the paid-up capital should thereafter be £24,000, on which a dividend of 5 per cent. for the half year, clear of income-tax, should be declared. Between September, 1847, and March, 1862, the capital of the company was treated as though it were £20,000. Up to 1862 the company had spent at Ramsgate £5899, and at Margate £5624, out of profits. The works grew, and every portion of them had to be enlarged. In 1862 the dividend was 10 per cent.; until then it had been going on from 5 to 6, 6½, 7, 8, 9 per cent. 1862 was the first time it was 10 per cent. The books show that the structural cost of the works at both stations exceeds £72,000. Since 1862 we have divided 10 per cent. on £24,000; but, in order to earn that 10 per cent. upon £24,000, we have employed the accumulated capital to the extent of £72,000. If we had only invested £24,000, we could not have made the gas to be sold to produce 10 per cent. Since 1866, except in one year, we have maintained a uniform price of 4s. The original capital of the water company was £10,000, with power to raise an additional £5000. In 1849 the directors found that £1341 had been expended out of profit in extension of pipes, enlargement of wells, &c., in order to meet increased demands. Up to 1849, the capital consisted of £8000, and in that year £1000 was added to it. In 1855 we established our second station at a cost of £6489, and for that purpose the additional £5000 capital was issued and called. In 1855-56 no dividends were paid, the shareholders applying the whole of their profit to the payment of the excessive expenditure. Between 1849 and the present time our expenditure on capital account out of income amounts to £19,110. Before 1849 our expenditure on capital account out of income was £13,000. The price charged for water has been regulated by the assessable value of the property. We have never made any extra charge for the supply for private baths or water-closets. The charge for manufacturing purposes is 1s. per 1000 gallons, unless they take a very large quantity, like the railway company do, and then a special agreement is entered into. For the last six years the dividend paid has been at the rate of 10 per cent. We have never had any application whatever from the Local Board for an increased quantity of water for sanitary purposes, to which we have paid no attention. They have never offered to take a larger quantity for sanitary purposes at a lower price, although I myself have been very anxious that they should do so, in order that the sewers might be properly flushed.

Cross-examined by Sir E. BECKETT: We deposited the bills as a protection against the bill brought in by the Local Board. Otherwise we had no intention of going to Parliament immediately. The bills were withdrawn under counsel's advice.

Sir E. BECKETT: Have you any intention, supposing you get our bill rejected, of depositing another next year?

Witness: We are anxious to put ourselves under the restrictions of the Water-Works Clauses Act and the Gas-Works Clauses Act.

Sir E. BECKETT: Why are you so anxious to put yourselves under those restrictions?

Witness: For the sake of the interest of the public, if it is supposed for their interest, and for our own interest. We have cared more for the interests of the public than for our own.

Mr. POPE: I am authorized by the directors to give any pledge that the committee may wish about putting the companies under parliamentary restrictions.

Sir E. BECKETT: I do not want to ask for pledges.

Cross-examination continued: Under the provisions of our Water Act, our dividends were unlimited, but for a great number of years we restricted ourselves to 5 per cent.—sometimes a little over, sometimes a little under—and the money, which otherwise might have been paid to us, was devoted to capital. There are 800 shares in the gas company, 547 of them being held by local people, and 253 by others. I was never informed before that the present works were sufficient to give a constant supply, and I never gave a thought about it before. We objected to turn the water on more than two hours a day, because there was so much waste caused by the bad fittings. I very much question whether the inhabitants of the town would like a constant supply, because it would entail the expense of altering the fittings.

Mr. *Thomas Wootton*, examined by Mr. MICHAEL, said he was a brewer in Ramsgate, and had resided in that town for 20 years. For about five years he had been supplied with the company's water for brewing purposes. He preferred that water to his own well. The supply had been very satisfactory, and so was the price—1s. per 1000 gallons. The supply of gas by the gas company was also satisfactory and good. He considered there were other and better ways in which the Local Board could spend their money than by taking over the gas and water companies.

Cross-examined by Sir E. BECKETT: He did not think it would be for the good of the town for the Local Board to have the control of the gas and water. He expected the Local Board would make a bad bargain. He had a constant supply for his brewery.

Mr. *Howell*, examined by Mr. MICHAEL, said he was an ironmonger and gas-fitter at Ramsgate. He had met with defective supplies of gas in people's houses, but that was caused by the pipes not being large enough. He had not found any deficiency of pressure where the fittings were proper.

Cross-examined by Sir E. BECKETT: He laid on some small pipes at the hotel in Pegwell Bay. The fittings there were generally old and imperfect.

Mr. *Larkin*, examined by Mr. MICHAEL, said he was a plumber, painter, and gas-fitter at Ramsgate. Generally speaking, the illuminating power of the gas was good, and the pressure adequate for general purposes. He had been often called upon by consumers to attend to their gas, because they complained of insufficient light, and he remedied the defects by putting in larger pipes. He was not obliged to put in pipes of excessive size in order to obtain ordinary light.

FRIDAY, MARCH 17.

The CHAIRMAN said: Though the committee think it very undesirable, in any case, to make suggestions in regard to arguments, either for or against a bill, they think it would not be fair that any circumstance should have any possible influence upon their minds, without communicating to counsel such facts as may have occurred. Probably, in the reply, reference will be made to the precedent of the Rotherham Gas Act, and to the interpretation put by Mr. Pope on the Public Health Act. Since this committee have been sitting, circumstances have occurred in the House which the committee think ought be called to the notice of the parties. On Wednesday there was a bill brought forward for second reading—the Burghs and Populous Places (Scotland) Gas Supply Bill—and the House read that bill a second time, on the understanding that it should be referred to a select committee. That bill appears to this committee to have some sort of analogy to the Ramsgate Local Board Bill, and the committee think it right, therefore, that the attention of counsel should be called to what occurred in the House.

Mr. *George Henry Ogston*, examined by Mr. MICHAEL.

I am an analytical chemist, and have had great experience in water analysis. I have analyzed two samples of the water supplied by the Ramsgate Water Company—one from Whitehall, and the other from Southwood. The total solid residue per gallon in the Whitehall water was 30·20 grains; total hardness, 17°; permanent hardness, 5½°; the quantity of ammonia in 70,000 parts was ·00147; of albuminoid ammonia, ·00217 in a gallon. It did not contain any sewage contamination, and was very excellent drinking water. In the Southwood water, the total solid matter was 34·20 grains per gallon; hardness, 17½°; permanent hardness, 6°; free ammonia in 70,000 parts, ·0021; albuminoid ammonia, ·0028. That is an unusually small proportion. It is not possible that any sewage contamination could be contained in those small proportions of ammonia. The water was absolutely free from sewage contamination.

Cross-examined by Mr. RICHARDS: The samples were delivered to me by Mr. Easton. I do not know if the company were pumping at the time the samples were taken.

Mr. *Frederick Joseph Bramwell*, examined by Mr. MICHAEL.

I have made myself acquainted with the condition of both the gas and water companies at Ramsgate. The consumers of the water are, in round numbers, £10,000 better off than they would have been had the company obtained, say, some fifteen years ago, an Act of Parliament authorizing an increase of capital, with a 10 per cent. dividend. In the case of the gas company, the consumers are £19,900 better off. I have visited the works of the water company, and my general report, with respect to them, is that they are extremely well devised; in fact, I do not think they could be improved for the purpose of a water supply from chalk, the sole available supply in that neighbourhood. The only suggestion I have to make is, that it would be well that a supplementary engine of modern construction should be put up at Whitehall; and I have been informed that an order has been given for one. The constant supply is entirely a consumer's question. If the consumers will go to the expense of fittings, it then is an absolute benefit to the company that a constant supply should be given. The existing works could give such a supply to Ramsgate if the consumers fittings were in proper order. I also examined the gas-works, and they appear to me to be in extremely good order, and to be adequate. Eighteen grains of sulphur as impurity is lower than the ordinary quantity. The appliances are such as would supply gas of proper illuminating power and with good pressure, and such as are requisite for the supply of gas to the district.

Cross-examined by Mr. RICHARDS: I think the company would have had a fair chance, 15 years ago, of getting a 10 per cent. dividend from Parliament. The shareholders have divided a diminished dividend, and the public have benefitted to the extent I have mentioned.

Mr. RICHARDS: The company have escaped the obligations of the general Acts?

Witness: Yes; but not having a law for them, they became a law to themselves.

Mr. RICHARDS: And a profit too, did they not?

Witness: They took the major profits, but the minor profits they invested.

Cross-examination continued: The Ramsgate Water Company have not given a constant supply, I suppose because they do not care to put the consumers to the cost of the necessary fittings. The experience at Norwich shows that when a consumer can draw water day and night, he is content with 15 gallons on an average, including that used for manufacturing purposes. The Public Health

Act of 1875 gives Local Boards full power to enforce proper conduct on the part of the companies. The summer visitors to Ramsgate add very little to the water consumption. They bathe in the sea, and they do not add to the waste. There is ample storeage at the works—namely, for 650,000 gallons. I think you might put the population as equal to 25,000, which, at 15 gallons per head would be 375,000 gallons; so that there is two days supply, supposing every engine they had broke down.

Mr. *George Livesey*, examined by Mr. MICHAEL.

I am the engineer for the South Metropolitan Gas Company, and have had long experience in gas matters. Last Saturday I examined the works of the Ramsgate Gas Company, and I regard them as most complete in every respect. They are, in almost every particular, more than adequate for the supply of the town. I saw there were 98 retorts set, and was informed that last winter only 56 were at work. That is a very much greater surplus than usually prevails in gas-works. As to distribution, I saw the pressure paper, and am satisfied the works are quite capable of giving an excellent supply, both as to pressure and quality. I did not test the illuminating power, but am sure the works are equal to supplying 14-candle gas.

Cross-examined by Mr. RICHARDS: I have heard the evidence of people in the place, about insufficiency of pressure, about the gas going out at the time they wanted it, and as to their inability to get cooking apparatus into action, and so on, and I cannot account for it. I am sure the works are capable of supplying gas at a sufficient pressure for all purposes. The maximum pressure was under 2 inches. I should think 11-candle gas sufficient, but believe the gas is of a higher illuminating power. I do not know an instance of any company going on without applying to Parliament for the length of time this company have.

Re-examined by Mr. MICHAEL: In London the companies are continually obliged to go to Parliament for power to raise further capital, but some of them have gone on for a time without such powers, and have done something similar to the Ramsgate Company, who are doing the right thing in the wrong way. There was all the apparatus necessary for testing the illuminating power of the Ramsgate gas, but I did not think it was of much use making a test, because it would have been said it was prepared for you on purpose. There may be exceptional cases in which, even in the best gas companies, the illuminating power may be diminished. On the occasion of a severe frost the gas has sometimes dropped a candle or two.

This concluded the evidence on behalf of the petitioners.

Mr. RICHARDS then addressed the committee, in summing up the whole case. He said that the issue presented was a tolerably simple one, namely, whether the Local Board of Ramsgate should, under the circumstances that had been laid before the committee, be entrusted with the supply of gas and water to the inhabitants. His learned friend, Mr. Pope, had treated with considerable scorn what he called the supposed grievances, and he resorted to the ordinary artifice of taking each grievance by itself, and saying "What does this come to?" He (Mr. Richards) submitted to the committee, that if the several grievances were taken together, the conclusion could be fairly arrived at, that the inhabitants of Ramsgate had great cause to complain of the position that they were in with reference to the supply of gas and water. They were entirely under the thumb of the companies; they had no power whatever to help themselves; they had no sort of control over the undertakings; and the only means by which they could interfere was to come to Parliament. Their doing so on the present occasion evidently produced an effect upon the companies, for they were then coerced into introducing bills of their own, and he considered that the course they had been persuaded to adopt in withdrawing these bills furnished the Local Board with a very strong argument in favour of their bill. The evidence must be so fresh in the minds of the committee that it was unnecessary for him to occupy their time in endeavouring to compare the statements of the witnesses with regard to the quality, illuminating power, pressure, and so on. The promoters produced as witnesses, inhabitants from almost every class in Ramsgate. On the other hand, the petitioners only called those people who (if any) would be likely to be satisfied with the supply, such as the harbour-master and the station-master, whose premises were supplied by a special main, and who, therefore, enjoyed advantages which were not accorded to the inhabitants at large. Public meetings had been called at Ramsgate, and a numerously signed requisition had been sent to Parliament, and therefore the committee could not doubt that the general feeling of the inhabitants was an earnest desire that the gas and water undertakings should pass into the hands of the Local Board. At the very last election, persons who were favourable to the transfer were returned by a very large majority. The companies were not at present subject to any restrictions from Parliament, as to the dividends paid to their shareholders, nor were the water company bound to give a constant supply. It was admitted on all sides, that the companies had for a great number of years evaded the obligations which Parliament from time to time imposed upon all gas and water companies. Mr. Curling, chairman of the companies, fairly acknowledged that they had deliberately kept out of Parliament, and the course they had adopted was in diametrical opposition to the whole policy of Parliament for the last 30 years. It was idle for Mr. Bramwell to say that the inhabitants were better off pecuniarily than they would have been if the companies had applied to Parliament for power to raise more capital. If they had done so 10 or 15 years ago they would not have got more than 7 or 7½ per cent., but they had set Parliament at defiance. Mr. Pope had said that they were now perfectly willing to be bound, in any possible way, to bring in such bills as would reasonably satisfy the Local Board, but his learned friend knew perfectly well that there was no way in which they could be so bound. The companys own course of conduct was their greatest condemnation, for they had withdrawn their bills, so that now Parliament could not have any control over them. Mr. Pope had spoken of confiscation of property, but nothing of the kind was ever contemplated. If the Local Board obtained the undertakings, they would pay the full maket value for them as ascertained by a competent expert. It had been argued on the other side that the Local Board should have proceeded under the Public Health Act of 1875. But the area of the Local Board was only a small portion of the areas of gas and water works companies; and if they had proposed to take possession of that portion of the gas and water works that lay within the Local Board district, the complaint would immediately have been that they were proposing to take the very cream of the district, and leave out St. Lawrence, which was comparatively poor. If a precedent was required for the present application, they need not go farther than the Rotherham case, where the committee had decided that it was for the good of the people at Rotherham that the gas-works should pass into the hands of the Local Board. Anything more completely in support of the present bill he was utterly unable to conceive. Grievances had been proved, and the Local Board asked Parliament now for a remedy. The population of Ramsgate was not inconsiderable, and their interests should be primarily considered, and the Local Board asked the committee to say that in the true interests of the inhabitants of Ramsgate the supply of gas and water ought to be in the hands of the Local Board.

The room was then cleared while the committee consulted. On the readmission of the parties,

The CHAIRMAN said: The committee find that the preamble of the Ramsgate Local Board Bill is not proved. The committee also wish to express an opinion that the Ramsgate Water-Works Company and the Isle of Thanet Gaslight and Coke Company should be brought under the control of Parliament at the earliest opportunity.

Legal Intelligence.

HIGH COURT OF JUSTICE—CHANCERY DIVISION.

THURSDAY, MARCH 17.

(*Before Vice-Chancellor* MALINS.)

RICHMOND WATER-WORKS AND SOUTHWARK AND VAUXHALL WATER COMPANIES *v.* THE VESTRY OF RICHMOND.

This case was before the court on the 10th of February (see JOURNAL No. 666 pages, 236-240), when an application was made for an injunction to restrain the vestry from constructing water-works for the supply of their parish, until they had given the plaintiffs the notices required by the Public Health Act of last session. His lordship then refused to make the order asked for until the decision of Parliament upon a bill then pending, to give the plaintiffs statutory powers to supply the defendants district, should be made known. The plaintiffs have since withdrawn their bill. Immediately, thereupon, the defendants served the plaintiffs with notice to go on with their motion, or accept the alternative, that an application would be made to dismiss the motion with costs.

Mr. GLASSE having ascertained from Mr. Pearson, the counsel for the company, that he was *not* intending to bring on the case, asked his lordship whether he had sufficient recollection of the case for him (Mr. Glasse) to go on with the arguments, or whether Mr. Pearson should open the case again.

The VICE-CHANCELLOR having been informed that the bill had been withdrawn, said the case had better be taken at some future day, and in the meantime he would read over the shorthand writer's notes.

Mr. GLASSE said he must take it next motion day, because in the meantime Richmond was being stopped from making the artesian well. At any moment, too, the Thames Conservators might get an injunction restraining the Southwark Company from supplying Richmond with water, because the only grant that they made was for the Richmond Company to take water from the Thames at Richmond.

Mr. PEARSON replied that he had a perfect answer to the Thames Conservators if they came there for an injunction.

The VICE-CHANCELLOR then said he would read over the notes before the next motion day, and then treat the case as a part-heard motion.

WORCESTER LENT ASSIZES.—SATURDAY, MARCH 11.

(*Nisi Prius Court.—Before Justice* FIELD.)

THE CORPORATION OF DUDLEY *v.* THE SOUTH STAFFORDSHIRE WATER-WORKS COMPANY.

This was an indictment preferred against the defendants for not supplying pure water to the Corporation of Dudley.

Mr. MOTTERAM, Q.C., and Mr. JELF were for the prosecutors, Mr. MATHEWS Q.C., and Mr. YOUNG for the defendants.

Mr. MATHEWS asked that the case might be postponed until Monday, in consequence of the illness of a material witness for the defence.

His LORDSHIP, in granting the application, expressed a hope that the case might be settled out of court.

Shortly before the rising of the court, Mr. MOTTERAM announced that Mr. Mathews and himself had agreed as to terms. They were that the verdict should be "not guilty," the defendants agreeing to pay prosecutors the sum of £200 for costs, and further agreeing to do what, if anything, Mr. Bateman, C.E., should say ought to be done, in order to render the supply of water to Dudley pure and perfect.

His LORDSHIP, in addressing the jury, said what had been done was very much to the credit of both parties, and by the arrangements made it was very probable and reasonable the town of Dudley would have a proper supply of water.

RICHMOND PETTY SESSIONS.—WEDNESDAY, MARCH 16.

(*Before Sir* HENRY PARKER, *Chairman; Admiral* STOPFORD, *and Lieut.-Colonel* BURDETT.)

THE VESTRY OF MORTLAKE *v.* THE BRENTFORD GAS COMPANY.

The Brentford Gas Company were summoned by the Vestry of Mortlake "for that the purity of the gas supplied by them in the parish of Mortlake, between the hour of six in the evening of the 31st day of January, and the hour of six in the evening of the 1st day of February, 1876, did not, when tested in the manner prescribed by section 26 of the Brentford Gas Act, 1868, equal the purity by the said Act prescribed."

Mr. ANDERSON, the vestry-clerk of Mortlake, said that their principal witness, Dr. Letheby, being ill, he had to apply for an adjournment.

Mr. EDMUNDS, who appeared for the company, offered no objection to this.

Mr. CARLEDGE: Is the gas going on badly, or is it improved?

Mr. ANDERSON: We haven't tested it since; it is rather an expensive process.

The CLERK asked Mr. Anderson if he could not tell from his personal observation.

Mr. ANDERSON: We do not go upon the illuminating power, but the amount of sulphur contained in the gas.

Mr. EDMUNDS: We say that the test is incorrect.

It was then arranged that the case should be adjourned for a fortnight.

Miscellaneous News.

THE AVERAGE METER SYSTEM FOR PUBLIC LAMPS IN LONDON.

Last week we published the statements issued by the Imperial Gas Company, in reference to the working of the average meter system in the parishes of St. Pancras and Paddington during the year ending Sept. 30 last.

The vestry of St. Pancras have since made the following reply to the statement, so far as its affects their parish:—

Reply by the Vestry of St. Pancras to the Statement circulated by the Imperial Gas Company.

First, with regard to the statement of the committee that the vestry have saved in the cost of gas in one year, as per Table No. 6, £2865 6s. 10d., the company say that about six-sevenths of this saving, viz., £2404 11s. 6d., has been effected by (1)-lessening the size of the burner from 5 feet to 4·6 feet, and (2) by reducing the number of lighting hours under the old system to those in force under the new system.

The vestry have learned by observations, and by experiments which have confirmed such observations, that a 5-feet burner (that is, a burner which, when new and in proper order, would consume 5 feet of gas per hour under a given pressure) may, under certain conditions, pass *less* gas, and, consequently, *worse* light, than a 4·6 feet burner when kept in order.

As regards Observations.—There is a general consent in the parish that the lamps give a better light under the new system than the old.

As regards Experiments.—When the adoption of the meter system was under consideration nearly two years ago, the committee gave directions to Mr. Scott, chief surveyor to the vestry, to select from different parts of the parish four or five burners showing an average flame. Four average burners were removed. These burners were tested at the gas company's works, in the presence of the committee, by Dr. Stevenson, the gas examiner to the vestry, and Mr. Hersey, chief inspector of the company, and they showed an average consumption of 3·96. These were the so-called 5-feet burners. The company may think that the vestry ought to state here that on this occasion one of the company's servants was sent

out to take two or three burners from the street-lamps in the vicinity, and these showed an average of more than 5 feet; one, indeed, which was broken, passing 7 feet. The committee, however, choose to rely upon the experiment which had been carefully made with the aid of thoroughly competent officers.

During the year ending September, 1875, under the meter system, the consumption of the burners is calculated monthly, and the average for the year has been 4·47, being ·51 more than the average with the so-called 5 feet burner.

Under the contract with the company, the vestry are required to take off all the regulators periodically, and have them brought up to the standard 4·6. No such regulation as this existed when the company's interest was to pass as small a quantity of gas as possible through a burner originally made to consume 5 feet per hour.

As to the Lighting Hours.—The vestry have reduced the number of lighting hours *paid for*. Under the old system, the company charged on the assumption that all the lamps were kept lighted from sunset to sunrise—or what amounted to the same thing, that each lamplighter occupied one hour in lighting or extinguishing, and commenced half an hour before sunset, and finished half an hour after, and so when extinguishing. Now, as a matter of fact, the company always took advantage of the twilight, and if any one will watch the lighting in one of the parishes where the company still continue to light, he will see that the company are just as anxious as the vestry to take this advantage. It would not be any use to the public if either the company or the vestry began to light half an hour before sunset in the months of June or July, when the twilight continues an hour and a half or more after sunset.

The vestry's experience, then, is, that under the present system the actual number of lighting hours is about the same as under the old system, the real difference being that now the vestry reap the advantage of long twilights, whereas under the old system this advantage went to the company.

Second, with regard to some of the particulars in the committee's report, the company say there is an over-estimate as to the charge made by the company under the old contract, the chief item being £65 12s. 3d., caused by reckoning the number of hours of burning during the year at 4320, instead of 4300 only, for which the company received payment.

The number 4320 was copied from a statement furnished to the vestry by the company when settling a claim made by the vestry in respect of an overcharge on the part of the company in wrongly estimating the number of lamps in the parish. If the company will prove that the correct number is 4300, the vestry will be pleased to make a further claim on the company in respect of payments made under the old system.

The other items, which the company put at about £10, are not given, and therefore cannot be dealt with.

Third, with regard to the saving in the cost of lighting, extinguishing, repairs, &c., the company say that the committee have omitted to state that from that charge was excluded the cost of painting, which was formerly included in the company's price. For this the company deduct £123 6s.

The vestry agree that the painting was included in the company's price, but, as the vestry were able to show that the company had not painted a single lamp for more than one whole year, the company were required to paint all the lamps after the meter system was commenced, and thus the cost of the first year's painting was saved to the vestry.

Fourth, the company are correct, in taking the annual proportion of the cost of meters, boxes, &c., at £320, and the cost of maintenance at £605 4s. 1d.

The vestry need only add the following from the report of the committee:—"This sum (£320) is more, perhaps, than ought to be allowed, especially when it is taken into consideration that the contractor is bound by his contract to leave the whole of the meters and boxes and the governors in good working order *at the end* of ten years." So that when the whole of the expenditure has been met by annual instalments, the plant will be worth nearly as much as now.

Against the statement of the company "that the meter system shows an actual loss of £324 17s. 6d.," the vestry repeat that it shows a saving of over £2200 in the year.

The company arrive at the conclusion that all the saving effected could have been effected by arrangement with the company for a smaller supply of gas.

But the vestry say that this is exactly what they did not want; they wanted a larger and more even, not a smaller supply of gas, and they believe that they have now secured this larger supply, and effected a saving of £2200 a year as well.

Fifth, the note of the company, the object of which is to show that the only small saving they are willing to admit is attributable to the fact (?) that the meters do not register to the full extent the gas consumed at the unmetered lamps, and that if the gas referees, to whom an appeal has been made by the company, permit a proper allowance, the balance against the vestry will be increased from £385 to £710.

The vestry are in communication with the gas referees on the subject of the company's appeal, and the so-called fact has yet to be proved. The vestry deny it altogether. If, however, the gas referees give the company all they ask—and it is not at all likely they will, for by so doing they will be disturbing a settlement which they themselves have made—still, the saving from the vestry's point of view will be over *eighteen hundred pounds a year*.

Printed by order of the Vestry.

THOS. ECCLESTON GIBB, Vestry-Clerk.

Vestry-Hall, St. Pancras, March 16, 1876.

METROPOLIS WATER SUPPLY.

Major Bolton reports that the water in the River Thames at Hampton, Molesey, and Sunbury (where the intakes of the West Middlesex, Grand Junction, Southwark and Vauxhall, Lambeth, and East London Companies are situated), was good during the first half, and in a dirty and turbid state during the remainder of the month of February, causing the water to be slightly stained after filtration. The highest flood state of the river was 2 feet 6 inches above the (6 feet) summer level, and the lowest was 5 inches above summer level. At Seething Wells, Kingston, the condition of the water in the river was good on four, indifferent on 11, and bad on 14 days. The highest state of the flood at this place was 4 feet 1 inch, and the lowest 7 inches above summer level. The highest temperature of the water was 47°, and the lowest 35°, while the highest temperature of the air at the same place was 50°, and the lowest 23°. These observations were made daily at 9 a.m. The rainfall for the month was 1·68 inch.

CORK GAS CONSUMERS COMPANY.

The Ordinary General Meeting of Shareholders was held on Monday, March 13—Mr. T. MAHONEY in the chair.

The following reports and accounts were presented:—

In laying before you the accompanying accounts, closed up to Dec. 31, 1875, we have to congratulate you on the favourable results of the half year's business.

Owing to the enlargement of the mains, which enabled us to give a better pressure to some of the outlying districts, and to the natural increase in the consumption of gas, which takes place in every city, the private rental exceeds that of the corresponding period of 1874. There is scarcely any increase in the quantity used by the public lamps.

You will perceive that the cost of coal is considerably diminished, and our residual account shows a small increase, notwithstanding the reduction in the price of coke which took place in the latter part of the year. This change of price was made necessary in consequence of the stock having become unusually large, and in order to reduce it still further, we were again compelled to fix a lower price in January. This led to an increased sale, and has brought the stock within reasonable limits.

The testing of mains and the relaying of services has already resulted in considerably diminishing the quantity of gas unaccounted for.

Under these circumstances we have every reason to believe that the profits of your undertaking will continue to be satisfactory, but we must remind you that, since the 1st of January, the price of gas has been lowered from 5s. 3d. to 4s. 9d., and that we are also receiving a lower price for coke. On the other hand, coals are somewhat lower in price, and less outlay will be required for wear and tear, as the suspense account, under this head, has now been cleared off. These items will go some way to meet the reductions in income referred to above.

Since the date when the accounts were closed, we have received from the Court of Bankruptcy, in the matter of our former accountant, a dividend of £193 5s. 9d., and an order for a small proportion of the expenses incurred in the arrest of the bankrupt. The court has also given directions that securities to the amount of £240 should be handed over to us, and we hold securities amounting to £193, which we are assured will be paid in full. It is expected that a further dividend will be paid by the court. As soon as the bankruptcy matter is finally closed, we will apply to the Crown for the expenses of the prosecution, which, in a case so important to the interests of justice, will, we trust, be allowed. These costs form the bulk of the balance of expenditure under this head.

The borrowing powers, usually granted by Parliament to gas companies, are equal to one-fourth of the share capital, and these powers are almost invariably exercised to the full extent. Up to the present time we have had the sanction of the proprietors for borrowing £20,000 out of the £30,000, which our Act of 1868 empowers the company to raise on debentures. Within the past two years, we have expended in extensions of your plant, £9829, while during the same period we have received on calls only, £5357. Under these circumstances, we think it would be well that you should give your directors the usual authority to employ in the whole, or in part, the unexercised parliamentary borrowing powers, if they deem it advisable to raise a portion of the capital at a low rate of interest, and a proposal to that effect will be submitted for your approval.

We have, out of the profits of the half year, set apart £300 for insurance, and £350 for depreciation. After making these appropriations, the balance of profit and loss amounts to £6255 0s. 5d. Out of this we recommend that a dividend at the rate of 5 per cent. per annum be declared, which will amount to £3238, and leave £3017 to be added to the reserve. This addition will raise this fund to £4886.

Resident Engineer's Report to the Directors.

Gentlemen,—We manufactured during the past half year the largest quantity of gas produced since the formation of the company, and have maintained an excellent supply throughout the entire district.

Your works are in very good condition, and I expect during the current year the outlay for wear and tear will be under the average.

Mr. Anderson's patent triplicate retorts were in action during the entire season, and gave very satisfactory results.—I am, gentlemen, your obedient servant,

THOMAS TRAVERS.

Gas-Works, March 4, 1876.

Dr. *Capital Account, Dec.* 31, 1875. *Cr.*

Share capital of the company		£150,000	0 0	Amount paid on shares	£129,783 0 0
Debentures		18,600	0 0	Ditto debentures	18,600 0 0
				Uncalled capital and shares not registered	19,698 0 0
				Due by shareholders on registered shares	519 0 0
		£168,600	0 0		£168,600 0 0

Revenue Account.

Coals		£9,584	11 0	Rental—	
Labour		2,556	16 0	September quarter	£5,085 18 2
Wear and tear		1,906	4 4	December ditto	12,533 2 9
Ditto, proportion of suspense account		344	5 10	Public lighting—	
Oxide of iron, lime, &c.		375	9 6	September quarter	756 13 0
Water and gas at works		204	12 4	December ditto	1,308 8 6
Public lighting		200	7 4	Transfer fees	3 5 0
Salaries		805	0 0	Residuals	5,690 17 0
Rents		117	11 8		
Rates		787	8 0		
Advertising and stationery		110	10 11		
Office expenses		121	3 6		
House repairs		4	6 3		
Auditors		20	0 0		
Reserve for directors fees		175	0 0		
Profit and loss		8,064	17 9		
		£25,378	4 5		£25,378 4 5

Profit and Loss.

Thirty-fifth dividend		£3,231	10 11	Balance	£3,915 15 0
Reserve-fund		684	4 1	Revenue	8,064 17 9
Interest—Debentures		409	1 3		
,, Bank, &c.		155	17 3		
Charges		133	2 4		
Insurance		37	3 3		
Provisional Order		52	7 0		
Law expenses		72	6 3		
Insurance-fund		300	0 0		
Depreciation-fund		350	0 0		
Bad debts and allowances		300	0 0		
Balance		6,255	0 5		
		£11,980	12 9		£11,980 12 9

Balance-Sheet, Dec. 31, 1875.

Capital account—				Permanent investment to June 30, 1875	£140,219 0 6
Shares	£129,783	0 0		Extensions from above date to Dec. 31, 1875—viz.:	
Debentures	18,600	0 0		Works £1,315 11 4	
Due to sundry persons	8,442	3 2		Mains 614 2 0	
Dividends unclaimed	196	17 9		Services 90 11 1	
Insurance-fund	1,093	10 2		Meters 227 19 0	
Reserve-fund £1,828 2 6				Ammonia 25 6 6	
Interest on above 41 2 8				Public lighting 16 13 6	
	1,869	5 2		Engineering 25 0 0	
Depreciation-fund	350	0 0		Purchase of Ardsulla 1,200 0 0	
Bank, current account	7,377	1 5		£3,515 3 5	
Profit and loss	6,255	0 5		Less received for account—meters and services 50 8 2	
					3,464 15 3
				Due by sundry persons	1,093 14 0
				Suspense account, *re* former accountant	1,726 19 5
				Rental account	13,263 2 9
				Public lamps	2,147 0 3
				Stock—	
				Coals, meters, mains, oxide of iron, &c.	10,227 5 11
				Cork and Macroom Railway Company—invested in their debentures	1,825 0 0
	£173,966	18 1			£173,966 18 1

The SECRETARY (Mr. Denny Lane) stated that, in accordance with instructions from the directors, he wrote to Mr. G. Anderson, the company's consulting engineer, requesting him to come over to Ireland and test Messrs. Still and Lane's patent before the holding of the present meeting. Mr. Anderson was, however, unable to comply with that request, owing to important business engagements; but he had written the following letter respecting the working of the company during the last half year:—

London, March 8, 1876.

Dear Sir,—I have a matter in hand that I fear will not permit me to visit Ireland till about the end of the month. In case, therefore, I cannot be present at the half-yearly

meeting, I would desire to say through you to the shareholders a few words. The reparations and extensions which we have carried out during the last two years show beneficially on the accounts you have sent me. The consumption of gas, which was for the half year ending 1873, 71 millions, and for the half year ending 1874 was 70 millions, is now for the last half year 75 millions, throwing out the odd thousands in each case. This increase has no doubt given satisfaction to those who complained of want of supply, and is due to the enlarged mains laid last summer. You have sold more coke in proportion to the quantity of coal used than in former half years. This is due to our now being able to get a better class of coal, and also to the reconstruction of a portion of the retorts left us by the old company. At the fitting time we must reconstruct a similar quantity that still remain, when the whole of the gas will be made by an apparatus constructed by ourselves. I notice also that while you have burnt less coke under the retorts, you have also burnt less tar, and as the remainder has been sold at a good price, the result has told in a larger return than usual for residual products. I will not conclude this letter with the very usual phrase "that I have every reason to be satisfied," for there are one or two points in which I look for further improvement, and my attention shall be further directed towards them when I come over at the latter end of the month.

I am, yours,

Denny Lane, Esq. GEORGE ANDERSON.

P.S.—I trust the shareholders will not have to resort to so low a dividend as 5 per cent. again.

The CHAIRMAN, in moving the adoption of the report and accounts, said he would read a letter which had been received from Mr. Anderson that morning, in allusion to the paragraph in the resident engineer's report, in which he says: "Mr. Anderson's patent triplicate retorts were in action during the entire season, and gave very satisfactory results." Mr. Anderson wrote to him, as chairman of that meeting:—

London, March 11, 1876.

Dear Sir,—I observe in Mr. Travers's report that he refers to my patent retorts having acted satisfactorily. I desire that you will, in your remarks from the chair, in my absence, state what I would do were I present—that the word "patent" involves no payment of royalty by the company, otherwise it may lead to questions being asked by the shareholders, which I would rather answer by anticipation. GEORGE ANDERSON.

This was carrying out the original arrangement made with Mr. Anderson, that the company should have the advantage of all his patents; and he was desirous that it should be understood that having used those triplicate retorts did not involve any additional payment. The statement of accounts now presented must show that the past season's working had turned out satisfactorily. There were two subjects to which he would first allude, and they were the only matters not in the position the directors would desire—viz., the test as to the value of the patent process, and the unsettled state of the affairs connected with the former accountant. The board had had every preparation made to test the process, in anticipation of Mr. Anderson being able to come over for that purpose in the middle or end of February. The quantity of gas required for the city did not permit them to allot a separate and distinct portion of the works, entirely cut off from the daily working plant, at an earlier period, it being the wish of the directors that the experiment should be made on a full scale, and the gas produced passed through one of the station-meters, which would be more satisfactory both to the shareholders and the partners. All things being in readiness, when Mr. Anderson did come, the test could be at once proceeded with. As Mr. Anderson suggested, the patentees had been, in the meantime, making experiments for their own satisfaction, and the company had occasionally used the process for the public supply. The affairs of the former accountant had been continually pressed on the attention of the parties having them in charge, and the board had received the sums mentioned in the report since the closing of the half year's accounts. They received some time since the securities purchased with the money taken from the company, and the sum which would remain as a debit in this account was mainly composed of the capture and prosecution expenses. When the bankruptcy account was closed, and there was no chance of any balance being available to recoup the company, they could apply to the Government with their claim, and they had every reason to expect that it would be recognized, as they did everything it was possible to do in this very important matter to secure the ends of justice. As brought under the notice of the shareholders at the last general meeting, the enlargement of mains had contributed to the satisfactory supply of gas to every district named in the city. Seventeen or eighteen years ago the houses at Sunday's Well were not one-fourth of their present number, and the main laid in that direction was naturally overtaxed of late years. Since the alterations were completed there had scarcely been a complaint of want of supply from the entire district. The same remark applied to the Glanmire Road and Blackrock. In fact, the only complaint they had was from some of the consumers who thought they got an over-supply,' and that their gas bills were larger than they should be. Now, he thought it well to remind the consumers that, as appeared by the company's accounts, the private consumption was largely increased, while the public lamps still remained the same; and that every consumer had it in his own power to burn a large or small quantity of gas, by the same attention to the consumption that was paid by the corporation, inasmuch as all received their supply from the same enlarged pipes, and all could exercise the same control. Although the company's coal account was less in money than for the corresponding period of last year, the quantity carbonized was largely in excess. This, and a diminished leakage account, must give a greater quantity of gas to the consumers. The borrowing powers of the company were sufficiently large to enable them to ecomomize their interest account, if they could use them to a greater extent as occasion offered, and the directors would bring a resolution before the meeting to give the board permission to issue debentures to the extent of £10,000 additional, should they see it advantageous to do so. Of course, these debentures would not be issued if the money was not required; but it had occurred more than once that they had an offer of money at a less rate of interest than they were already paying on debentures, but they were unable to take advantage of it, because it would be in excess of the borrowing powers granted to them. They would issue those debentures at the lowest rate procurable; and his own impression was, that they ought to get them out at 4 per cent. Seeing that the company were in so good a position, and had so small an amount of debt, he thought the security they could offer was equal to any in the kingdom. The directors wished to be in a position to accept an offer of money when it was made to them at a lower price than they were now paying, and they also required a little more capital to work with. There was only one other item in the accounts to which he wished to allude—the allowance made for bad debts. On the last occasion they took £300 for bad debts, and he told the shareholders then that they would have to do the same this year. They were now doing so, and hoped that on the next occasion a much less sum would clear off old scores. If any bad debts were brought before them then, they would be much less in amount. The board had greatly increased the collecting staff, with very satisfactory results. Still, they had great difficulty in getting consumers to see that they should pay their accounts promptly; for while they were ever ready to run into the office and make complaints of the supply, and expect those complaints to be attended to with punctuality, they did not scruple obliging a man to call at their houses five and six times for the payment of small accounts. The directors were, however, doing their best to remedy this state of things.

Mr. M'OSTRICH seconded the motion.

Mr. CORKER asked if the retorts of Mr. Anderson, alluded to in the report, were put there instead of Still and Lane's patent.

The CHAIRMAN: Not at all.

Mr. CORKER: Are they different things?

The CHAIRMAN: Quite different altogether. Mr. Anderson's patent is for arranging the retorts themselves. By it there is a great saving and an increase in the production of gas. The patent process of Messrs. Still and Lane entirely applies to the articles put in the retorts, which is altogether a different matter.

Mr. CORKER: Is there any further communication to be made about that patent to-day, or whether it will be tested soon?

The CHAIRMAN: We were not in a position to make the test, as Mr. Anderson will not be able to attend until the end of the month. Everything was prepared for the test, and everything remains in the same state of preparation still, so that the moment he comes over the test will be made.

Mr. G. LYNCH asked what was the reduction on the quantity of gas unaccounted for during the half year.

The CHAIRMAN: It was something over 16 per cent., but not quite 17 per cent., for the whole year.

Mr. G. LYNCH: Could you state to us what was the average production of gas per ton of coal for the half year?

The SECRETARY: Something over 8000 feet.

Mr. DELACOUR made some inquiries respecting the position occupied by the company in relation to Messrs. Still and Lane's patent.

The CHAIRMAN deprecated discussion of the question at the present moment, and until the tests had been made by Mr. Anderson. In answer to a further inquiry, he stated that the patentees were not satisfied with the previous experiments.

The SECRETARY said he wished to say a few words on this question, because it was a matter in which he was deeply interested, not about the money part, but because his own honour and credit were concerned, after having been connected with the gas company for 20 years. As a shareholder he wished to say that if any shareholder had been deceived, the shareholder who had been most deceived was himself. He had a character to uphold in the city; he was an old citizen, and gentlemen there knew that for ten times the amount involved he would not make a statement that he did not believe. He did not want to prejudge the question, but so great was his anxiety, before the holding of the meeting, to make the test of the patent, that as soon as he found Mr. Anderson could not come to Cork, he applied to the engineer of the Dublin Gas-Works to come down and test it. That gentleman replied that, in consequence of the business he had in hand at this time of the year, he could not. He then applied to Mr. Macnie, the engineer of the Londonderry Gas-Works, a gentleman who was a high authority as a gas engineer, and he replied by telegraph he could not come. Next he applied to Mr. Baker, the engineer of the United General Company in Limerick, and he telegraphed one night that he could come, and next morning he telegraphed that he could not do so. Therefore, he (Mr. Lane) had left nothing undone to procure a test. With reference to the value of the patent, although he did not want to prejudge the test, he would give them three figures, and he would ask them to consider whether there was not ground for holding that they had a profit in consequence of its being used. He would give the result of the work for five years before it was used, and the profits of the five years after, although during the latter five years the profits were not what they should have been, because, unfortunately, they got damp coal that took fire in their stores. They might remember that formerly they paid no city rate on their mains, then £2800 a year in valuation. The corporation moved to have city rates charged, and they would remember it was decided by the Recorder that the company were subject to city rates, and the consequence was that they had to pay a largely increased taxation. Now, comparing the five years after the process was used with the five years before, the result was this: In the last five years they paid in additional taxation £4758, they paid the shareholders increased dividend £12,620, and they transferred £5500 to the reserve-fund, showing that they paid out in that way £22,878 more in those five years than in the five preceding years. He asked them, could any one, looking into those figures, have any other impression on his mind than that the patent was one yielding large profits to the company? He tested the value of it as to the production of coke, and he found a large increase of coke; but he had not yet, in consequence of the scale of works being too large, tested the illuminating power or the quality of gas produced. He had consulted with Mr. Canning, the manager of the gas-works at Newport, Monmouthshire, who was requested to test the process, and found that in all respects—in the production of gas and the quality of the gas—there was an increase. He asked the company to bear those figures in mind in considering the value of the patent. Mr. Canning stated that there was a saving of 10 per cent. in the quantity of gas, and a small increase in the illuminating power, besides a saving of coke.

After some further conversation, the report and accounts were adopted.

Mr. ALCOCK moved that a dividend at the rate of 5 per cent. per annum on the paid-up capital, payable on the 16th of March, be declared. He hoped that this would be the last 5 per cent. dividend that they would declare.

Mr. FRY seconded the motion, which was adopted.

Mr. BRESNAHAN moved that the directors be authorized to exercise to the extent of £10,000 the additional borrowing powers conferred on the company by the 26th section of the company's Act of 1868.

Mr. KELLER seconded the motion.

Mr. DELACOUR submitted to the directors a suggestion that the shares not fully paid should be called up.

The CHAIRMAN said the directors had considered the question, and they did what they thought was best. It would be a curious position to put the shareholders in, to call in their money unless they had the certainty of giving 8 per cent. on every occasion.

Mr. ALCOCK doubted whether they wanted the money at all; for, after meeting all liabilities, they had two or three thousand pounds to the right side of the account.

The CHAIRMAN said they required the revenues that were coming in, and the money at present available, to meet their demands. The directors did not intend to issue the debentures unless they wanted the money; and he thought the shareholders might give them power to raise it if necessary during the ensuing six months, and at the next meeting they could examine what the directors had done.

The SECRETARY said, as a matter of figures, he might mention that the amount of borrowed money they had was exceedingly small—it was only 13 per cent. of their capital. In other companies it was 20 and 25 per cent., and he knew one very prosperous company where the borrowed money was equal to 70 per cent. of the share capital, while in their company it was only 18 per cent. of the share capital, or 13 per cent. of the whole capital.

The motion for increasing the borrowing powers was adopted.

On the motion of Mr. A. M'CARTHY, seconded by Mr. DELACOUR, a vote of thanks was passed to Mr. Mahoney for presiding, and the proceedings terminated.

REDUCTIONS IN THE PRICE OF GAS.—The directors of the Alfreton Gas Company, at their meeting on the 7th inst., resolved to reduce the price of gas from the 1st of April 5d. per 1000 cubic feet. The directors of the Crystal Palace District Gas Company announce a reduction to 4s. from and after the 25th inst. The Wandsworth and Putney Gas Company announce that from and after the next taking of the indices of the meters at Lady-day, the price of gas in their district will be reduced to 3s. 9d. The directors of the Cleveland Company have just reduced their price from 5s. 6d. to 5s. At the meeting of the Huddersfield Town Council, on Wednesday last, a report of the Gas Committee was brought up, submitting a recommendation that the price of gas should be reduced, as from the 1st of January, from 4s. to 3s. 9d., the discounts being continued as at present. After some discussion, the recommendation of the committee was agreed to.

HARROW DISTRICT GAS COMPANY.

The Half-Yearly Meeting of the Shareholders in this Company was held at the London Tavern, Bishopsgate Street, on Monday, the 13th inst.—Mr. J. GLAISHER, F.R.S., the chairman of the company, presiding.

The SECRETARY (Mr. J. L. Chapman) read the notice convening the meeting, and the report of the directors, as follows:—

The directors are pleased to be able to report that the business of the company continues to increase.

The illuminating power and quality of the gas are now tested by the local authorities, and have been found satisfactory.

The gas-rental for the half year shows an increase of £143 compared with the corresponding period of last year, and the coke account has also improved.

The balance of profit and loss account shows a total of £873 3s. 9d. for disposal, out of which sum the directors recommend the payment of a dividend at the rate of 5½ per cent. per annum, which will leave £53 3s. 9d. to be carried forward to the credit of the next account.

Two directors, Messrs. Horsley and Hudson, and one auditor, Mr. Fenton, retire by rotation, but, being eligible for re-election, offer themselves accordingly.

Dr. *Revenue Account, for the Half Year ended Dec. 31, 1875.* *Cr.*

Manufacture of gas—				Sale of gas—		
Coals, including all expenses	£1,204	17	10	Michaelmas quarter—		
Purifying materials, water, oil, &c.	39	14	3	Private rental—		
Salary of engineer	75	0	0	2,059,300 cubic feet at 6s.	£617	15	10
Wages	199	1	7	163,400 cubic feet at 6s. 8d.	54	9	4
Works, machines and apparatus—maintenance of, repairs, and labour	264	9	0	Public rental and under contracts	65	11	0
Distribution of gas—				Christmas quarter—			
Mains and service-pipes, repairs, maintenance, renewal, and labour	16	10	6	Private rental—			
Meters, renewing, repairing, and refixing	21	9	3	5,333,900 cubic feet at 6s.	1,600	3	2
Public lamps—				505,500 cubic feet at 6s. 3d.	158	0	8
Lighting	25	2	4	Public rental and under contracts	132	10	0
Rents, rates, and taxes—				Meter-rental, half year	63	9	0
Rents	12	13	6	Residual products—			
Rates and taxes	35	7	11	Coke, less labour and cartage	383	6	0
Management—				Tar	70	8	0
Directors and auditors allowances	110	10	0	Transfer fee	0	7	6
Salary of secretary	25	0	0				
Collector's commission	25	0	0				
Stationery and printing	22	6	0				
General establishment charges	33	6	0				
Sundries—							
Bad debts	4	18	11				
Law expenses	48	18	2				
	£2,164	5	3				
Balance carried to profit and loss account	981	15	3				
	£3,146	0	6		£3,146	0	6

The CHAIRMAN, in moving the adoption of the report and balance-sheet, said: Gentlemen, you will see from the first sentence in the report that the business of the company is increasing. I will refer to that presently; but I will now proceed to the second paragraph in the report. In that you will have an interest, because you will wish to know the power and quality of the gas which we make and sell. By our Act of Parliament, the local authorities can at any time send a qualified person to test the gas, and the local authorities have used that power.

A SHAREHOLDER: Is that at the works or at the outlet?

The CHAIRMAN: It is at the works. I have the reports of that examination. The first is dated January 25 last, and it is as follows:—"In accordance with the provisions of the 33rd section of the Gas-Works Clauses Act, 1871, I hereby report the results of the testings of the gas at the works of the Harrow Gaslight and Coke Company on the evening of the 24th of January. Firstly, as regards illuminating power, the illuminating power of the gas was at 7.50 p.m. equal to 14·96 standard sperm candles; secondly, as regards purity, the gas was quite free from sulphuretted hydrogen; thirdly, as regards pressure, the pressure balanced at 8 p.m. a column of water 3·3 inches in height." That was very satisfactory; but on the 29th of February another examination was made, which I will read. It is as follows:—"In accordance with the provisions of the 33rd section of the Gas-Works Clauses Act, 1871, I hereby report the results of the testing of the gas at the works of the Harrow Gaslight and Coke Company on the evening of the 28th of February, 1876. Firstly, as regards illuminating power, the illuminating power of the gas was at 8 p.m. equivalent to 16·22 standard sperm candles, and, therefore, fully equal to the requirements of the Act; secondly, as regards purity, the gas was quite free from sulphuretted hydrogen; thirdly, as regards pressure, the pressure balanced at 8 p.m. a column of water, 33-10ths of an inch in height.—E. J. Midwinter, gas examiner, appointed by the Harrow Local Board." These reports show that the article with which we are dealing is good. We feel sure that it is the shareholders wish that we should supply such an article that no one can find fault with it, and this has been carried out, certainly to our satisfaction, and I think to the satisfaction of the inhabitants of Harrow. I think the test is exceedingly satisfactory. The third paragraph of the report shows an increase in the gas-rental in the half year of £143. Now, that change is in the right direction, but I candidly confess I was in hopes that the improvement would have been greater than that, because it is somewhat less than in the corresponding half, and I was in hopes that we might have taken that as typical of what it would be from period to period. There have been many houses empty, which we thought would have been occupied, and there is every probability that this increase will be larger. I next come to the balance of profit and loss, and here we have a very satisfactory increase. We have paid £200 less in coal, our coke account has improved, and we have been able to lay out a little more in improvements; and we are enabled to offer you a dividend at the rate of 5½ per cent. per annum. You know what I have said from the first, that our prospectus would be redeemed; and the more and more I see of the works, the more I feel convinced that the prospectus will be redeemed. We should, indeed, have redeemed the prospectus at once had it not been for that unfortunate *contretemps* of the price of coal. All the work is getting into that satisfactory state, that I have very little doubt that we shall still progress as before. It has been half per cent. from period to period, and it has now reached 5½ per cent., and I think we have every prospect of success in future. There is an item in the accounts of law expenses, and that is an expense which I am always desirous of avoiding. It sometimes happens, however, that we must incur law expenses; but I do not know that we shall regret the course we took on this occasion. The Highway Board action is now settled, and the law expenses paid. The balance-sheet is satisfactory, so I do not know that I need occupy your time more, though had matters been otherwise I should have had more to say. I therefore propose—"That the report and balance-sheet, as signed by the auditors, be received and adopted."

The DEPUTY-CHAIRMAN (Mr. J. Chapman) seconded the resolution.

Mr. RANDALL said he saw from the report that the company had supplied in the Christmas quarter 505,500 cubic feet at 6s. 3d. Was he to understand from that that the company were now supplying gas at 6s. 3d., for which they had received 6s. 8d.?

The CHAIRMAN replied in the affirmative. As he referred to the reduction last time, he mentioned that the board had not, in the performance of their duties to the shareholders, seen their way to reduce the price at Harrow below 6s. at present, although his experience in all gas-works was that every reduction in the price was attended with a good deal of advantage. Since they last met, however, the authorities at Harrow had quadrupled their assessment, and they were obliged to be cautious, and see clearly that they could do their duty to themselves; and, weighing all the circumstances, they had not seen their way, particularly in face of the increased assessment, to reduce the price below 6s., and, till they saw their way clear, he did not contemplate a reduction below that figure.

A SHAREHOLDER: Did the gas examiner give any notice to the company prior to his visit?

The CHAIRMAN: No; he came down and took things as he found them. That is perfectly right.

Mr. C. HORSLEY said he thought it was well that the shareholders should know that, in an examination of this kind, the gas being up to the required standard, the parochial authorities paid for it.

The CHAIRMAN: Oh, yes; that is so. The company are provided with a testing apparatus.

The report was then adopted unanimously.

The CHAIRMAN moved—"That a dividend at the rate of 5½ per cent. per annum, free of income-tax, be now declared, and this day paid."

Mr. RANDALL seconded the resolution, which was carried unanimously.

The CHAIRMAN: You will see, gentlemen, that two of the directors, Mr. Horsley and Mr. Hudson, retire, and offer themselves for re-election. I do not think there is any one more qualified to propose their re-election than I, as chairman. The board is generally a complete board, and, if you look through the list of attendances, you will see there is scarcely ever any one absent. I do not think I can render any better service to the company than by proposing their re-election.

The resolution was seconded, and carried unanimously.

Mr. HORSLEY said he was very much obliged to the meeting for re-electing him. He should not feel satisfied till their position was much improved.

Mr. HUDSON expressed his thanks for being re-elected. He had been a director from the first, and it had been his constant endeavour to make the concern a success, and living right in the midst of the whole of it, he knew pretty well what was going on, both at the works and abroad. He hoped that their next meeting, and each succeeding meeting, would show an improvement, and that the dividend would be larger every time they met.

Mr. KILSBY then moved, and Mr. BEADELL seconded, the re-election of Mr. Fenton, the retiring auditor, and the motion was carried unanimously.

The CHAIRMAN said the auditors saw every voucher, and did their work thoroughly well, but he must give them some more work yet.

Mr. FENTON, in returning thanks, hoped the duties of the auditors would be more arduous.

Mr. PENNY said he was sure they would join with him in a vote of thanks to the chairman and the directors. As the chairman had so clearly laid down, their course was a progressive one. The balance-sheet showed that a very considerable sum had been spent in extensions. He believed the money had been well spent, and would be to the advantage of the company. The large amount of money expended would render it unnecessary for any further outlay for some time to come, and to a certain extent, therefore, his function had ceased. He retired into the ordinary body of shareholders, and he was not proposing this vote as being on the other side (the directors side) of the table, which perhaps he might consider himself up to the present time. The directors—and particularly the chairman—had given the utmost attention to the shareholders interests, and having done their duties so thoroughly, they deserved the best thanks which the shareholders could give them.

Mr. FENTON, in seconding the motion, which he did with very great pleasure, said he concurred with everything Mr. Penny had said.

The CHAIRMAN, in reply, said: We have worked, gentlemen, as one, in the hope that we should have your best thanks, that you should feel that we had done our work well. I may, perhaps, now refer to that which has been mentioned once or twice—namely, to the railway which we hope will come to Harrow. I was in hopes to-day of being able to tell you that the first sod had been turned. The last we heard of it, however, was that, three or four months ago, a meeting was held, and the money was authorized to be raised. I have not heard anything since; still, I believe that the making of the railway will be of such great advantage to this company, that you may be well assured that my colleagues and myself will watch it with great interest, as, indeed, we shall watch over every interest affecting the Harrow Company. I believe this undertaking is a kind of pet with us—we want to make it a success, and we shall do the very utmost to bring this about. I give you my best thanks for passing such a pleasant and unanimous vote for our past services.

Mr. HORSLEY then proposed a vote of thanks to the officers of the company. They were, he said, very important members, to whom they looked forward to the increase of their dividends; and he warmly referred to the services of Mr. Chapman, the resident engineer and secretary. He anticipated much better results when the retorts were in good order.

Mr. A. H. BAYNES, F.R.A.S., a director, seconded the motion, and reiterated the remarks of the previous speaker.

The CHAIRMAN supported the motion. He received every day a report as to how much coal had been carbonized, and what gas had been made; and if he saw a little difference, Mr. Chapman was well aware that he would receive a communication from him. For some time past he had rarely had occasion to do so. He had no doubt that when Mr. Chapman had his new retorts, he (the chairman) would be in a position to announce more satisfactory results.

The motion having been carried unanimously,

Mr. J. L. CHAPMAN, in acknowledging the compliment, expressed his gratification at the steady increase of their prosperity. As to their not having increased the gas-rental so much as the chairman could have desired, he thought it was rather satisfactory, considering the increase in the dividend. They were progressing in a fair and satisfactory manner, and he hoped they would continue to do so. Hitherto he had not been furnished with the very best materials; but the directors had now placed him in a position in which he hoped to earn a very fair dividend for the shareholders.

The CHAIRMAN reminded the shareholders that the dividends were waiting for them, and he hoped all would receive them that day.

The proceedings then terminated.

CHESTERFIELD WATER AND GAS COMPANY.—The ordinary meeting of shareholders was held on the 13th inst.—Mr. R. T. Gratton in the chair—when the following report was presented and adopted:—"The directors have the satisfaction of being able to recommend the payment for the half year of the full rate of dividend to all classes of shareholders. The profits of 1875 have been £7685 9s. 11d.; the interest and dividends for 1875 amount to £7150 1s. 4d. The new gas-works have been in satisfactory operation since the commencement of the winter. All the reservoirs have been full, or nearly so, for some months. The aggregate amount of the gas and water rental has doubled in the last eight years, and during the last half year the rate of increase has exceeded the average. To enable the directors to raise further capital, to meet the increasing demands of the district for gas and water, they are promoting a bill in Parliament, which received the unanimous approval of the shareholders at the recent extraordinary meeting. The bill has passed a second reading in the House of Commons.

BRADFORD (CORPORATION) GAS SUPPLY.

Reduction in the Price of Gas.

At the Meeting of the Bradford Town Council, on Tuesday, March 14—the Mayor (Mr. W. Sutcliffe) presiding—

A report from the Gas Supply Committee was brought up, recommending that the council do reduce the price of gas from 3s. 6d. to 3s. 4d. per 1000 cubic feet as and from the 1st of January last.

Alderman Shepherd moved the adoption of the recommendation, and, in doing so, said the question had been continually asked by members of the council when the gas would again be reduced to 3s., the price at which it was supplied before the old gas-works came into the hands of the corporation. In reply, he had to remind the council that the increase beyond that price took place in 1873, and was owing to the great and unprecedented advance which then took place in the cost of coal and other materials necessary for the production of gas. He had always stated that a reduction would be made as soon as a change in the price of the necessary material and labour employed in the manufacture of gas had taken place. This reduction had already occurred in the price of coal, and it had therefore been considered that the price of gas should be lowered accordingly. But it must be remembered that while coal had fallen in price there was the question of the price of labour, and the shortening of the hours of work, and the continued high price of other materials. Under the circumstances, the committee proposed to make the price of gas per 1000 feet 2d. less than it had been, or in other words 4d. per 1000 feet more than it was before the advance made by the corporation.

Mr. Ingle seconded the motion.

Mr. Newboult said he thought it would have been better if, before the council was asked to assent to the reduction, the committee had laid before them the balance-sheets of the gas-works. In this way the council would have had a better opportunity of judging of the merits of the proposed reduction. He did not wish to dispute the abilities of the committee, but he certainly thought the council ought to have been allowed to investigate the books before they gave their sanction to the resolution. He had been making several inquiries of gas companies in different towns in the county, and with one exception, Sheffield, the charge made for gas in Bradford was lower than it was anywhere else. But there was just this difference between this town and Sheffield—and that appeared to be the reason which had prompted the committee in proposing to lower the price to the extent of 2d. per 1000 feet—whatever was burnt by large consumers was charged for at the rate of 2s. 10d., whereas to small consumers the charge was 3s. 6d. Taking all the towns throughout the country, the minimum price of gas was 3d. 1d., and from that it extended to 16s. per 1000 feet. On asking questions respecting the supply of gas, he had been invariably referred to Manchester, to the profits they had made there, and while in that town he called at the gas office, and made a thorough investigation. The result of all his inquiries amounted to this: Last year the price of gas in Manchester was 3s. 8d., while in Bradford it was only 3s. 6d. In Leeds the charge was 3s. 9d. per 1000 feet; at Liverpool it was 4s. 3d.; and in London, 3s. 9d. What he wished particularly to point out, however, in this matter, was, that while in Bradford they had derived such large profits from their gas-works, not a single penny was allowed for depreciation of plant. It was his candid opinion that the profit declared on the balance-sheet was not a *bonâ fide* profit. The works must, as a matter of course, be depreciating year after year, and while it was doubtless very pleasant for the chairman of that committee to show a profit of £20,000, it must be remembered that some years hence in all probability another chairman would occupy his (Alderman Shepherd's) place, and would have to account for the deficiencies. Personally he should prefer that the question of reduction be referred to the committee, or that a special committee be appointed to take the matter into consideration. There were 27,000 ratepayers in Bradford, who had to pay the full rate of 3s. 6d. per 1000 feet, while to large consumers the charge was only 2s. 9½d. It was this large discount allowed to large consumers which prevented a greater reduction in the price to the mass of the people.

Alderman Storey thought that the chairman of the committee had given no special reason why the alteration should be made. So far as he knew, there was no special grievance under which consumers of gas suffered, and which made them ask for relief. His view of the gas question was that the works belonged to the ratepayers of Bradford; that the ratepayers were responsible in every way for the works, and the manner in which they were conducted, and that if they were to lose money on the concern the ratepayers would have to make up the deficiency. He therefore considered that the right principle was to fix the rate at such a figure as to place consumers in as good a position as that occupied by the inhabitants of neighbouring towns, and he maintained that when the prices were fixed as they were at present, at from 3s. 6d. to 2s. 9d., they could not find any neighbouring town, or even any town in the country occupying the same position that Bradford occupied, where gas was supplied at a lower rate. Any profit that was made at that price legitimately belonged to the ratepayers of the borough, and ought to go towards the reduction of the rates equitably to all ratepayers in proportion to their rateable value. He could not see how any other principle could be adopted with fairness, and he protested against any favour being granted to any one section of the community which was not granted to the whole. If the council assented to the reduction of 2d. per 1000 feet, they would make a sacrifice of £5107, which really belonged to the ratepayers; and it would require something like a rate of 1⅞d. or 2d. on the whole rateable value of the town to replace that. He objected to this bonus being given to the consumers of gas, and taken from the ratepayers, on the ground that the reduction would not affect all classes of the people in the same way. The ratepayers consumed gas not in proportion to the rateable value of the property. If the reduction was made, the large consumer would get most of it; whereas a man who might have a large amount of rateable property, but who did not consume much gas, would not gain the least advantage. Why were not consumers of gas satisfied with the present position of affairs? They paid for what they got at a lower price than neighbouring towns, and the profit, he considered, in fairness, ought to be divided amongst the whole of the ratepayers. There were many classes of trade carried on in Bradford where the consumption of gas was, in fact, infinitesimal. As an illustration, he might name the woolstaplers. There was a large amount of property occupied by the woolstaplers, but they consumed comparatively very little gas. He had spoken to one gentleman in this town, who told him that, for the last year, his gas bill amounted to £2 2s. 9d., and yet his premises were rated at £460 a year. And there were many others in the same position. Now, in that case, the reduction proposed by the committee would make a difference to the woolstapler of 2s. only, but the 2d. in the pound rate, that would be required to make up what they were giving to the consumers, would amount to £3 16s. 8d.; so that the gentleman would lose £3 14s. 8d. by the change. Another interest which would be affected in the same way was the piece-room interest. These piece-rooms were occupied, in a great measure, by manufacturers who had their works outside the borough, and they used, he might say, absolutely no gas. The benefit of the reduction would, therefore, be nothing to them, while, as their premises were heavily rated, their loss on the rates would be very considerable. As to the question of discount, there was a great deal to be said on both sides, but he would only remark that the reduction recommended by the committee would confer a benefit on a section of the community that would not be shared by all the ratepayers alike. He should, therefore, propose an amendment to the effect that, considering the price of gas in Bradford was already lower than in any other town similarly circumstanced; that the gas-works had been purchased by the ratepayers; and that the consumption of gas by the ratepayers was not in proportion to their rateable value, the council was of opinion that the proposed reduction would be chiefly a bonus to the large consumers, who already received a discount of 20 per cent., and obtained their gas at the rate of 2s. 9½d. per 1000 feet, and that a special committee be appointed to consider on what principle a reduction could be made, so as to secure to all the ratepayers an equal participation in its advantages.

Mr. Pullan seconded the amendment. He remarked that at Halifax, the gas-works belonged to the corporation, the price of gas was 3s. 8d. per 1000 feet, and the highest discount allowed to large consumers was 7½ per cent., and varied down to 2½ per cent. At Huddersfield, the price was 4s., and the highest discount 5 per cent. At Sheffield, the discount was 8 per cent. At Leeds, the rate of discount was just about half that allowed at Bradford, thus:—At Leeds, consumers of £15 worth of gas in the half year were allowed 1½ per cent., whereas in Bradford, they were allowed 2½ per cent.; from £15 to £30 worth, Leeds, 2½ per cent., Bradford, 5 per cent.; from £30 to £40 worth, Leeds, 3¾ per cent., Bradford, 7½ per cent.; from £40 to £60 worth, Leeds, 5 per cent., Bradford, 10 per cent.; from £75 to £90 worth, Leeds, 7½ per cent., Bradford, 15 per cent.; from £90 to £105 worth, Leeds, 8¾ per cent., Bradford, 17½ per cent.; above £105 worth, Leeds, 10 per cent., Bradford, 20 per cent.; and while in Leeds, to obtain 15 per cent. discount, £400 worth of gas must be used in the half year, in Bradford all users who consumed above £105 worth got 20 per cent. He had the names of twenty of the chief consumers in Bradford, who got among them no less than £2000 discount in the half year. He held that that was unfair; and it was the duty of the council to reconsider the matter.

Mr. J. Hill supported the original motion, and said he could not admit the force of the arguments employed by the mover of the amendment. His (Alderman Storey's) chief argument seemed to be that those who were large ratepayers, but not gas consumers, would suffer severely if the price of gas was lowered, simply because there would not be the same amount of profit to be applied to the reduction of the rates. Now he (Mr. Hill) would be fortunate if the price of gas was kept as it was, or even put at a higher figure, because he happened to be the owner of cottages, and also let room and power. But Alderman Storey's argument might be carried further; for instance, if the price of gas was put up to 6s. 8d. per 1000 cubic feet, the profit would be such as to prevent the necessity for any rates at all. Was it fair that the consumers of gas should provide all the rates of the town? It would be a very different thing if the gas was actually costing the ratepayers money to produce; if that were the case, he could understand Alderman Storey's argument. The chairman of the committe estimated that if they lowered the price to 3s. 4d., they would still have a present of £30,000 to give to the ratepayers at the end of the year—a sum equal to a rate of 8d. in the pound. If that was not enough for the ratepayers to get out of those who consumed the gas, he thought the ratepayers were excessively greedy. A great deal had been said about difference in the price of gas in Bradford and in other towns. He wondered that Alderman Storey did not see that that argument applied to the water as well. In Bradford, the prices charged for water were as much below those of other towns as the price of gas was; and in the water, as well as in the gas, discount was allowed to large consumers; so that Alderman Storey's argument would apply to water as well as to the gas. If Bradford happened to be favoured in making gas cheaply, it did not follow that they should give all the benefit to those who did not use the gas. As to the question of discount, it should be borne in mind that there was a considerably greater expenditure in supplying the smaller consumers than in supplying the large consumers, in proportion to the amount of gas they used. Each cottage, for instance, required a separate breaking-up of the street, a separate service-pipe, a separate collection and inspection, so that a person who used £1 worth of gas caused as great an expense in this direction as the larger consumer. To him it seemed only fair that the large consumer should have the discount, because, even when it was taken off, he was quite as good a customer to the town as the small consumer.

Mr. Armitage said the question at issue appeared to be how the profit could be fairly and equitably divided. One point bearing on this question seemed to have been lost sight of altogether, and that was, why was it that the advance in price was made a year or two ago? The advance was made because of the increased cost in the price of coal, and not because the gas-works were not making a profit. The committee had now found that a reduction of 2d. per 1000 feet would about meet the reduction in the price of coal since the advance was made; and therefore they recommended a reduction of 2d. Before the gas-works came into the hands of the corporation, the amount of profit that the old company were allowed to make was limited; and he believed that, even with the reduced price now recommended by the committee, the corporation would get as good a profit as the old company were ever allowed to make

Alderman West replied to the remarks made by Mr. Newboult, as to no allowance being made by the committee in respect of depreciation since 1872. The reason he assigned for it was that, after taking over the works from the old company in 1871, the corporation had allowed for depreciation a sum of £35,000. On the street-mains, a deduction of 10 per cent., or £7353, was made; on service-pipes, 50 per cent., or £5052 2s. 6d.; on plant in Mill Street, 15 per cent., or £5287; on plant in Thornton Road, 15 per cent., or £6899; and on plant in Valley Road, 11·77 per cent., or £8583. The committee thought that that depreciation was sufficient to last to the present time, and when he informed the council that the land alone in Thornton Road and Mill Street was worth far more at the present moment than the corporation gave for it, even with the plant that was on it, they would be satisfied that the committee were perfectly justified in not making any further deductions for depreciation. But the committee had in hand a sum of £18,000 as a reserve-fund, and they had also decided that next year they would commence to take certain per centages off several items for depreciation. Mr. Newboult stated that there were 27,000 people in the borough who were paying for gas at the rate of 3s. 6d. per 1000 feet, and, if there were, would not these gain anything by the reduction of 2d. per 1000 feet? He maintained they would be gainers directly. Alderman Storey made one or two remarks, in which he thoroughly agreed, and, if a large reduction had been in question, he (Alderman West) would not be there, supporting the chairman of the committee. Alderman Storey said that any profit that might be made from gas, belonged to the ratepayers at large. That was true; but to distribute that profit equally among all the ratepayers was not an easy matter. The very argument used in favour of no reduction, he had heard used by another member in favour of a reduction to 3s. per 1000 feet. That member quoted cases of persons who rented room and power. They were large consumers of gas, and they paid no rates. The assessment of such persons as those, in Bradford, amounted to £30,000. These men said they were not ratepayers, and it was not fair that the ratepayers should make a profit out of what they paid for gas, and distribute it among themselves, without giving the consumers any share of it. He (Alderman West) did not agree with that argument; but Alderman Storey could not deny that it was as good an argument as that of the woolstaplers. The fact was, they could not distribute the profit perfectly equally. What they should do was, to try and meet both sides; and that was the reason why he supported the chairman in a reduction of 2d. per 1000 feet. This would benefit such persons as rented room and power, and would benefit the consumers—the large consumer and the small consumer alike; and when the profit came to be reckoned at the end of the year, there would be something to go to the relief of the rates. What was the position of the gas-works since 1871? There had been a sum of £53,500 paid out of the works, and the ratepayers at large had gained a reduction in rates to the extent of £43,500. Next year they would gain a further reduction of £16,000, and there was a sum of £18,000 in hand, as a reserve-fund. They had better, therefore, be satisfied to "let well alone," and be content to accept the reduction of 2d. It would be very discourteous to the Gas Committee to appoint a special committee, and it would have been better if Alderman Storey had asked the Gas Committee to take the question of discount, and any other matter which he thought to be wrong, into their consideration, with a view of altering them if necessary.

Alderman STOREY said his sole object was to get an inquiry into what would be a satisfactory principle on which the charge for gas might be reduced. The principle he had laid down had not been questioned by any subsequent speakers. That principle was that the works belonged to the public; that the ratepayers were responsible for any loss or accident; and that the profits earned by the gas-works ought to be divided equally among all the ratepayers. He questioned whether it was desirable to reduce the price at all. Looking at the great expense to which the corporation had been put in school boards, sewerage works, street improvements, and other extraordinary expenditure, and also taking into account the likelihood of a season of bad trade in the district, with the manufactories running short time, was it not very likely that the £5000 they now proposed to give to the large consumers of gas would be wanted before long?

Alderman SHEPHERD, in reply, said the question of allowance for depreciation had been so well dealt with by Alderman West, that it was not necessary to dwell further upon it. But he would just point out that, in reference to the Mill Street property loan, the corporation got that property for £30,040. Now, those premises covered 11,390 yards of land, and the whole purchase-money, including the plant on the ground, came to about £2 12s. 9d. per yard. As everybody was aware, land in that property had lately been selling at prices varying from £5 to £10 a yard. In the same way, the service-pipes, when the old works were purchased, were estimated at £10,104, from which sum a deduction of 50 per cent. was made for depreciation. Since then other pipes had been laid, bringing up the total value to £13,000; but it was admitted that for years the old company had laid such pipes out of the revenue, and that at the present time the value of the service-pipes in the borough was, at least, five times that estimate. Then, coming to the matter of discounts, the idea seemed to be that small consumers of gas, who got no discount, were placed at a disadvantage, but really the small consumers were not as good customers to the town as large consumers were. As an illustration, he would take the case of the largest consumer, and compare it with a number of those who belonged to the class of smaller consumers. There were 11,453 consumers whose half-yearly accounts did not exceed 10s. each, and the average of which was not more than 6s. On the other hand, Messrs. Lister and Co. paid last year £2090 for gas, or, speaking broadly, £1000 half yearly. For that £1000 the committee supplied gas equal in amount to that supplied to 3000 cottages of the class named. Now, there were four meters at Messrs. Lister's, which were inspected twenty-four times a year, and which could be inspected in half an hour. But when they took 3000 cottages, and reckoned that, on an average, the gas inspector could pay 100 visits daily, it would be seen that thirty days would be occupied in inspecting meters alone, and there was the same difference with reference to the book-keeping and the collecting of accounts. Thus, the difference in the expense of inspecting meters alone was as follows:—Messrs. Lister cost them 12s. a year, and for 3000 cottages the cost would be £144, and a further sum of £144 might be reckoned for extra book-keeping, stationery, and collecting. Then to the four meters at Messrs. Lister's there were four service-pipes of cast iron, the total value of which was £5, whereas each of the 3000 cottages had wrought-iron service-pipes of the value of 10s. each; so that here again there was a capital of £1500 on which interest had to be paid. In addition to that, there was leakage for each separate service-pipe to the cottages. So that there was really no doubt that Messrs. Lister paid more towards the profit of the gas-works than the large number of cottages which used the same amount of gas. But Alderman Storey had said there was no demand for this deduction. He would ask, had it not been a question at every meeting of the council recently as to when the price of gas was to be reduced? Then as to dividing the profit equally among all the ratepayers. Mr. Hill had shown that persons who rented room and power, and who were large consumers of gas, paid no rates whatever, so that they would receive no benefits from the gas profits that went to reduce the rates. It was therefore impossible to make the gas expenses fall equally on all parties, and the only way, therefore, was to do it as well as they could, and he considered the proposed reduction would be the fairest way that could be devised of lightening the burden. Reverting to the question of accidents, which was an important one, of course both gas and water works—in fact, every undertaking of the corporation—was liable to accidents, and for these the ratepayers were responsible. He would remind them that the Gas Committee had in hand some £18,000 with which to meet contingencies. But his great argument on that matter was that during the last year or two gas profits to the amount of £43,000 had been handed over to the ratepayers, who had the benefit of it; and he thought that would stand in the form of a reserve-fund. As to the construction of the new works, he might say they had already paid interest on undeveloped capital on the works at Laisterdyke and Valley Road, and he did not fear but that, in spite of the expenditure of capital, and in spite of bad trade, he would be able to present at the end of the year a balance-sheet showing as large, if not larger profits than those realized last year. The proposal to appoint a sub-committee over the head of the Gas Committee he regarded as nothing short of an insult to the common sense of the gentlemen composing the Gas Committee. It would be most foolish to take the management of the gas-works out of the hands of the experienced gentlemen forming the Gas Committee, and place them in the hands of persons who knew no more about the work than did the mover of the amendment.

The question was then put, and the amendment negatived by a large majority, and the original motion was carried.

IRON AND COAL TRADES OF SHEFFIELD, SOUTH YORKSHIRE, AND NORTH DERBYSHIRE.

(FROM OUR OWN CORRESPONDENT.)

The local iron trade is to all intents and purposes becoming more depressed week by week, and there are no visible tokens of any approaching improvement. In the pig iron department a few small lots have been sold during the week, at figures which are a couple of shillings or thereabouts under those recently current. Foundry pig is wholly neglected, the establishments devoted to that class of work being almost wholly devoid of both present employment and orders. This remark has especial reference to the foundries at Sheffield itself, and must not be taken as referring to the large concerns of the same nature which are situate within a dozen miles of Sheffield, in Derbyshire, and the southern division of the West Riding. These great establishments have advantages which are not possessed by the smaller places, such as an abundant supply of coal and coke on the spot, blast furnaces, and deposits of ore. By these advantages they are enabled to save the cost of a second melting in the production of such articles as gas and water pipes, inasmuch as the iron in those cases is run direct from the blast furnaces.

There is next to no inquiry for merchant iron, although any quantity of common bars could be had at £7 12s. 6d. to £7 15s. per ton. The only departments of the local iron trade which are at all actively engaged are those in which boiler and armour-plates are made. The largest armour-plate ever rolled was turned out on Wednesday last, at the Cyclops Works of Charles Cammell and Co., Limited. It weighed 35 tons, was 18 feet long, 5 feet wide, and not less than 22 inches thick.

There appears to be every probability of a strike on a large scale in the local coal trade. The miners at all the parts of the collieries of the two counties, dealt with in this report, have received notices of a reduction of 15 per cent. in their wages, to come into operation on the 14th of April. The top-men at some collieries are also to be reduced 7½ or 10 per cent., as the case may be, about the same date. The men are not very well organized at present, but they appear determined to show fight, and are holding district meetings at which that intention is pretty clearly expressed. In the meantime, the output of all kinds of coal continues to be in excess of the demand, although the men do not work on the average more than three days per week, and prices are very low. Steam coal, usually in great request at this season of the year, is neglected, and cargoes can be had at 8s. to 9s. per ton at the pits.

IRON AND COAL TRADES OF SOUTH STAFFORDSHIRE AND EAST WORCESTERSHIRE.

(FROM OUR OWN CORRESPONDENT.)

There is no noteworthy alteration in the condition of the iron trade of this district since last report. The market for finished iron is again feebly supported by the distribution of a few specifications for sheets and plates for India, and galvanized fencing wire and roofing sheets continue in moderate inquiry on account of the Australian and New Zealand markets. With these exceptions the trade is decidedly flat, and producers have great difficulty in keeping their works in operation, even during the three days per week which is now the usual average employment of ironworkers throughout the district. Buyers are evidently keeping back orders until prices are more settled, as an important reduction at the forthcoming quarterly meeting of the trade appears inevitable. Marked bars are nominally unchanged at £10 per ton, but very good brands may now be obtained at a lower figure. Unmarked iron is quoted on the basis of £8 per ton for bars, but bars of fair average quality may readily be obtained at £7 10s.; and, though prices are declared to be quite unremunerative under the present conditions of manufacture, yet they are still weak, and have a decidedly downward tendency. Large consignments of Belgian iron are still coming into this district, and a heavy contract for rails for the Admiralty has just been taken by a Belgian firm.

The market for pig iron is still very much depressed, and, notwithstanding the great curtailment of production, the yield continues to be out of proportion to the demand, and stocks are increasing. Additional furnaces are being "blown out" every week, and in this department of the trade prospects are gloomier than they have been for some years past.

The new Wages Board, though not yet quite completed, is practically established, and the ironmasters generally express themselves very hopeful of the benefits likely to be derived from the board in any dispute that may arise in the future.

The coal trade is gradually, but surely, declining, and rates will probably be reduced early next month. Both masters and men see that a revision of prices is now inevitable, and it is probable that no dispute will arise in the settlement of the wages question. Good furnace coal may now be had as low as 8s. per ton, but around Dudley the price of best forge coal is still maintained at 13s. per ton; but, in that part of the district, the market has been upheld to some extent by heavy railway contracts.

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

With the exception of a little better demand for best coal for house-fire purposes, consequent on the severe weather of the past week, there is no improvement to report in the general position of the coal trade of this district, and sale prices continue so very irregular, that actual values can only be approximately arrived at in a great many cases. Nominally, the quotations are the same as those last given. Good Arley, at the pit's mouth, in the Wigan district, being quoted at about 12s. 6d. per ton, and Pemberton four-feet from 10s. to 11s. per ton, according to quality.

For gas coal, a few odd inquiries come to hand, but there is no real business yet doing on which to form a basis as to prices. Consumers are expecting to place their contracts on easier terms, and, as I pointed out in a previous report, there is every indication that prices will rule lower than last season, although it is at present difficult to say to what amount.

The present short supplies of engine fuel cause the market for slack to have a very firm tone, and it is not improbable that, when the demand for brick-making sets in, prices will move upwards. Good slack, at the pit's mouth, in the Wigan district, cannot now be bought for less than 4s. 6d. per ton; and good burgy is also steady in price, the quotations ranging from 6s. to 6s. 6d. per ton at the pit.

The pits throughout Lancashire continue working short time. In some cases, they are not running more than five days to the fortnight, and the present extremely low prices ruling for common coal have caused colliery proprietors to close some of these seams altogether.

For coke the demand continues very dull, and there is no regularity in prices, owing to the underselling going on to secure orders. Good Lancashire cokes for foundry purposes, delivered in the Manchester district, are offering at about 22s. per ton, and Durham ditto at 1s. and 1s. 6d. per ton more.

In the position of the iron trade, there is very little change to report. Prices are practically the same as those last quoted, and there are no orders of any importance coming forward. Consumers simply buy the smallest possible parcels to cover their most pressing requirements, and there is no disposition whatever to enter into forward engagements. Lancashire brands of pig iron are still quoted at about 62s. 6d. per ton for No. 3 foundry, and 61s. 6d. for No. 4 forge, delivered into the Manchester district; but makers would be prepared to give way somewhat if orders were offered, and Lincolnshire iron can be bought at 2s. per ton below the local makes. Middlesbrough iron is offered at about 57s. 3d. for named brands of No. 3 foundry, 56s. 9d. for No. 4 foundry, and 56s. 3d. for No. 4 forge, delivered into this district, and G. M. B.'s can be bought for about 6d. per ton less. Manufactured iron shows no change from last week, either as regards orders or prices. The quotations nominally are about £7 12s. 6d. for ordinary Lancashire and Middlesbrough bars, £7 15s. for Sheffield, £7 17s. 6d. for Staffordshire bars, and about £5 10s. per ton for puddled bars, delivered into this district.

THE COAL AND GENERAL TRADE OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

The coal market in the North of England continues to be very dull and flat. During last week steamers and sailing vessels were detained upon their passages from the south to the Tyne and Wear through the stormy weather, and several small ships have been disabled. Notwithstanding this fact, coal freights had not been so low for a considerable number of years as they were during the whole of last week. Some steamers were reported as having engaged to carry coals to London at the extraordinary low figure of 3s. 9d. per ton, and others at from 4s. to 4s. 3d.; Rochester, 4s. 6d. per ton; and Hamburg, £6 10s. per keel. These rates are not considered to pay, and, if business were continuing long in such a state, another fleet of boats would be laid up, or else there would be some sort of crisis. Shipping business is also flat to the Mediterranean, but just a little better for the Baltic. The shipment of gas and household coals from the Tyne Dock, shows a little or no diminution; but it is still currently reported that a good deal of the second-class sorts of these coals is sent to the Continent on consignment. It is not at all probable, in the present uncertain condition of the coal trade, that many contracts will be made this spring. Very few have been entered upon hitherto. The steam coal trade remains in a wretchedly poor state. Pits are working no better time. Scarcely any of the collieries in the steam coal trade exceed three days a week.

There is no more favourable report to make of the iron trade. Like the coal trade it seems to hang on from week to week without any material improvement. There is considerable slackness amongst the engine factories. Scotch firms seem to be cutting things so fine, that business which was expected to have come to Newcastle and district, has been taken up at Glasgow and some other towns at a lower figure than the state of wages here would allow. The chemical, fire-clay, fire-brick, and other manufacturing trades are quiet, and the exportations of

manufactured goods to the Continent remains in the same unsatisfactory condition as last week. None of the ordinary trading steamers are able to make up full cargoes for any of the continental ports.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Sir Windham Anstruther's Gas Supply Bill has excited a considerable amount of attention throughout Scotland, among the various governing bodies, and many of the Scotch Members of Parliament have been kept "up to the mark," in reference to it, by their constituents, or by gas companies and gas corporations. On Tuesday last the Town Council of Edinburgh had it under consideration. The approval of the report of the Lord Provost's committee, recommending that a petition in its favour should be presented to Parliament, was moved by Mr. Mossman, and, after being seconded, an amendment disapproving of the report was moved by Mr. Durham, who called for the minutes of the meeting of the committee to be read. The clerk read the minutes, from which it was shown the proposal to petition in favour of the bill was carried by a majority of one. The amendment was seconded by Bailie Tawse; but, after a good deal of discussion on the subject, the motion was carried by a majority of 17 against 13, and two of the members declined to vote.

Another somewhat important body, the Commissioners of Supply of the County of Edinburgh, held a meeting a few days ago at which it was resolved to take no action in reference to the matter, the bill being ordered to lie on the table.

The Town Council of Selkirk, at a meeting held last Monday night, unanimously resolved to petition in favour of the bill; and on the same day the Town Council and Police Commissioners of Dunfermline came to a similar resolution. The bill has also met with approval from the Town Council of Montrose, the Town Council of Renfrew, and a public meeting of the ratepayers of Lockerbie.

At Burntisland the gas question has for a long time been in a somewhat involved state. The Town Council determined to promote a municipal bill in which they proposed to secure powers for a corporation gas supply, but they have met with opposition from the North British Railway Company, who are the owners of the gas-works at Burntisland, which they have for many years had. The result of the opposition is, that the Town Council have resolved to withdraw their proposal to acquire the gas-works, and at their last meeting they decided to petition in favour of Sir Windham Anstruther's gas bill in the hope of gaining their object through that measure, when it becomes law.

The Town Council of Aberdeen have approved of a report of their Bills Committee, recommending that no action should be taken with reference to the bill under notice.

On Saturday, the 11th inst., the partners of the Newport Gaslight Company held a general meeting for the purpose of considering whether or not they should take steps for extending the endurance of the company beyond the original period of 21 years, which will terminate on the 7th of February, 1877. On the motion of Mr. John Berry, who presided, seconded by Mr. H. Walker, it was unanimously resolved to continue the contract of co-partnery for a further term of 21 years from the date already mentioned. From the increase of population going on in the town, and the consequent increase in the demand for gas, certain extensions of the manufacturing and storing power will, doubtless, be required; indeed, some operations are already contemplated.

Considering the generally high standard of illuminating power of the gas supplied throughout Scotland, the Perth Corporation gas certainly stands somewhat low. The latest report of the gas testings, in the "Fair City," that I have seen, is—Maximum, 26·17 candles; minimum, 25·37 candles; and average, 25·83 candles.

The Inverness Water Commissioners have resolved to borrow £41,000 in order to meet the expenses of the new water supply undertaken by the corporation. The repayment of the loan is to extend over 50 years, and will cost 4 per cent., with 13s. 2d. per cent. to wipe out the debt within the period. The estimated annual expenditure will be £2563; and to meet that expenditure the following rates are to be charged:—On owners, 1d. per pound levied on the gross rental; domestic rate on houses, 1s. per pound; on shops, 6d. per pound. These assessments, together with the charges on railway works, hotels, distilleries, &c., and the Drummond district, outside the burgh, are expected to realize £2830 per annum.

A letter has been received from Mr. Bateman, C.E. (who is at Cannes, in the south of France), by the Forfar Town Council, thanking them for the preference which they have shown him in connexion with their proposed water supply scheme, and saying that he will undertake the work.

The Dunfermline Town Council are now sanguine that all opposition to their Glendevon water supply scheme has been got over. The same is practically true of the Edinburgh Water Act Amendment Bill, particularly in reference to the proposed Roseberry reservoir.

The pig iron market has shown little sign of animation during the past week, and on Friday the closing price was down at 58s. 4½d for buyers, and 38s. 7½d. for sellers. In the coal market dulness is still the rule. Shipping orders on the Clyde are very scarce, and prices are still tending downwards.

BIRMINGHAM WATER-WORKS COMPANY.—A meeting of the proprietors of this company was held on Tuesday last—Mr. Heaton in the chair—to declare a dividend for the past half year. The chairman said the business to be transacted was quite of a formal character, and need only occupy a very few minutes. The directors had no report to read, and nothing to comment upon. He might say, however, with reference to what passed at the last meeting, the agreement for the transfer of the undertaking to the corporation had been carried out in the most satisfactory manner. There had been no hitch, no question, and no difference between the directors representing the company and the corporation. With reference to the annuities, the certificates, he believed, had all been delivered to the different persons entitled to them, and acknowledged. The winding-up of the undertaking was going on, and in about three weeks the shareholders would be called together to take some necessary steps for the dissolution of the company. There now only remained for that meeting the declaration of the dividend, the amount necessary to pay which was handed over by the corporation, according to agreement, on the 1st of this month. He had, therefore, to propose, "that the maximum statutory dividend payable in respect to the called-up capital of the company be declared for the half year ending Dec. 31, 1875, less income-tax, and that the same be payable by dividend warrants, and forwarded to the respective proprietors this day." Mr. Malins seconded the motion, and it was unanimously adopted. A vote of thanks to the chairman and directors concluded the proceedings.

EASTBOURNE GAS COMPANY.—The ordinary half-yearly meeting of shareholders was held on the 28th ult., when the directors reported that an expenditure of £548 19s. had been made on the capital account during the past half year, in further extending the mains of the company to supply new houses with gas. A comparison of the revenue account with that of the corresponding period of last year was evidence of the continued prosperity of the company, as shown by the increased amount received from private consumers, and on the sale of residual products, whilst the principal item of increase on the expenditure side of the account was, as might naturally be expected, in the wages of the men at the works, the business of the company demanding the employment of additional hands. The present contract with the Pelaw Main Colliery Company, for the supply of their gas coals, will expire on the 13th of April next, and the directors hope to renew it upon favourable terms. The large amount of outstanding accounts included payments made since the date of the balance-sheet for 1058 tons of coals used prior to the 31st of December last, when the stock was completely exhausted, owing to the difficulty experienced in obtaining coals from the colliery. Large consignments had, however, since been received. After taking into account the assets and liabilities of the company, there was a balance of £1866 1s. 4d. available for dividend, and the directors recommended that a dividend at the rate of £7 per cent. per annum be declared and paid upon the £5000 capital in B shares (being the full amount to which they were entitled), and a dividend at the rate of £10 per cent. per annum upon the £20,000 original capital of the company, which would leave a balance of £691 1s. 4d. to be carried forward to the next account.

A SELF-LIGHTING GAS-BURNER.—The *Birmingham Daily Post* says that useful and ingenious industry, from which Mr. Lowe once vainly hoped to extract "a little profit," is threatened with a rather serious blow by an American invention, which is now in course of being introduced to this country, for the lighting of gas-jets without the use of match, fusee, taper, or other extraneous means of ignition. To the key or tap of an ordinary gas-burner is affixed a flattened cylindrical chamber about the diameter of a shilling, with narrow elongated vent or conduit rising parallel with the burner, and extending nearly to the nozzle. In this chamber, which is fitted with a small spring hammer, also connected with the key, is placed a coil of percussion tape, issuing through the before-mentioned vent. By the simple turning on of the gas in the usual way, the little hammer is made to strike one of the pellets on the tape close to the nozzle of the burner, and the faint spark resulting, instantaneously ignites the issuing stream of gas. The flame is extinguished, of course, by the same backward action of the key which checks the flow of gas. As long as the tape lasts—which, in the case of a burner used every day, is usually about three months—the owner is absolutely independant of matches or fire, and when the coil is exhausted, it may be renewed for the moderate cost of one penny, or the burner may be lighted in the ordinary way. Neither danger nor uncertainty attends the working of the mechanism. The little hammer never fails to ignite the fuse or tape which fires the gas, and the fuse itself throws off neither spark nor ash. The advantage of the invention in point of cleanliness, saving of time, and avoidance of the trouble, risk, and other drawbacks inseparable from the use of matches and tapers for gas-lighting purposes, have been long and extensively recognized in the United States, and we feel sure that they have only to be known to command an equally wide popularity in this country. Apart from other and more material considerations, the novelty and ingenuity of the self-lighting burner, and almost magical effect of its automatic action, will, doubtless, commend it to the favour of many persons; but its practical uses also are obviously considerable, and for all establishments where ease, safety, and rapidity of lighting are desired, as in hotels, theatres, concert halls, and other places of public resort, it will prove a great boon. Expense may, perhaps, interfere with its very general adoption in manufactories and places of business; but even in establishments of this kind, it will be found useful, we think, to have one or more of the self-lighting burners constant and ready, as a source of illumination for the ordinary jets; whilst in households of the better class, the absolute safeguard it affords against the carelessness of servants, and the dangers of matches and lighted tapers, will be readily appreciated.

Register of New Patents.

818.—CHIVERTON, E., Southsea, Hants, "*Improved means of, and apparatus for, lighting gas-lamps and burners.*" Provisional protection only obtained. Dated March 5, 1875.

This invention embraces a box or case with two diaphragms therein, one larger than the other, and weights tending or acting to depress them, but of such amount, that when a comparatively low pressure is applied, neither of the diaphragms, or only the smaller or lower one of the two, will be lifted; but that when a maximum pressure of gas is on, or a certain intended pressure is exceeded, both the diaphragms and their weights will be lifted, and the motion thereof will mechanically open one gas-pipe or passage and close another, both of which passages are fed from the under side of the lower or smaller diaphragm. One of these pipes or passages leads to the burner proper, called the main burner, and the other to a smaller or auxiliary burner, one or the other (but not both together) being intended to be constantly burning. The passage to the main burner is the one to be opened, and that to the auxiliary burner to be closed by the high or maximum pressure referred to; and the relative sizes of, and weights upon, the upper and lower diaphragms respectively, are so proportioned as to retain the passage ways to the burners in the open and closed positions respectively, notwithstanding that some reduction of the maximum or high pressure takes place, and, indeed, until it is reduced to or below an intended degree of lower pressure, when the upper diaphragm with its load will fall, and the passage to the main burner will be closed, and that to the auxiliary burner be opened.

820.—WISE, W. L., Adelphi, London. "*An improved continuous horizontal apparatus for washing or absorbing gas or vapours, or for distilling liquids.*" A communication. Patent dated March 5, 1875.

This apparatus consists in a closed tank or reservoir, divided into compartments, which communicate one with the other by holes or apertures made in the partitions, the lower holes being for the passage of the liquid, and the upper holes for the passage of the gas or vapour from one end of the apparatus to the other. Over each of the holes for the passage of the liquid into the inner compartments is affixed a tube or pipe, bent upwards, and rising vertically to rather above the intended level of the liquid; and over each of the holes for the passage of gas or vapour into the inner compartments is affixed a gas or steam tube, or pipe, of less diameter than the liquid pipes referred to, and the gas or steam tubes, or pipes, extend downwards, and by their lower ends, which are serrated, dip into the liquid pipes respectively, being concentric thereto.

The liquid is fed into the apparatus from a separate feed-tank, in which it is kept constantly at the required level by a float and suitable valve. The liquid passes from the feed-tank into the apparatus, and consecutively through each of the compartments, by passing into each of the liquid pipes, and being projected therefrom by the action of the steam or gas issuing from the steam or gas pipes.

826.—JOHNSON, J. H., Lincoln's Inn Fields, London, "*Improvements in traps or apparatus for separating liquids from vapours or gaseous fluids.*" A communication. Patent dated March 5, 1875.

This invention relates to apparatus to be employed for blowing off or separating automatically the water contained in vapours or gases, such, for example, as the water of condensation from steam-pipes, the water carried along in pipes for compressed air, and the like.

833.—FARNSWORTH, S., Mansfield, "*Improvements in valve apparatus for controlling the passage of water or other fluids.*" Patent dated March 6, 1875.

The object of the invention is so to arrange the parts of the valve that, whilst the passage for the flow of the water or other fluid may be fully closed when desired, a clear and uninterrupted way may be obtained for the flow of such liquid or fluid when desired, by the valve and parts acting therewith for closing such passages being then taken fully out of the course of the current. For this purpose the valve is connected by pin joint with a lever arm working in a chamber of sufficient size for the purpose. The valve is opened by a screw wheel acting on a rack applied internally to the valve-lever or externally to the axis of the valve.

838.—HUMPHRIES, J. R., Middlesbrough-on-Tees, "*Improved apparatus for preparing the joints of leaden and other soft metal pipes.*" Provisional protection only obtained. Dated March 6, 1875.

This improved apparatus consists of a cup of brass or other suitable metal, in the form of a hollow inverted cone, cast on, or attached to a spindle, which latter is provided with a square end, suitable for insertion into the socket of an ordinary hand-brace. In one side of the cup is formed a slot, running at, or nearly at right angles to the base, and into this slot a steel knife-blade is inserted, and secured to, and kept in position by a lug or projection formed on or attached to the cup. In order to prepare the end of a pipe for jointing, it is inserted into the conical cup, and upon the latter being rotated, by means of a hand-brace or other suitable arrangement, the knife is caused to act upon the surface of the pipe until the latter is tapered sufficiently for use.

839.—COOKE, J., Langley Old Hall, Durham, "*Improvements in the construction of rotary engines and pumps.*" Patent dated March 6, 1875.

This invention consists in improvements on a patent granted to the present inventor, bearing date the 20th day of April, 1868, No. 1279, and has for its object the obtaining of an equable or nearly equable flow of the fluid or gas without using duplicate machines on opposite or nearly opposite centres, as is at present necessary.

862.—MANN, W., Blackfriars Road, Surrey, and OWENS, S., Whitefriars Street, London, "*Improvements in valves.*" Patent dated March 9, 1875.

This invention relates particularly to the improvement of that class of valves commonly called slide or sluice valves, which are applicable for gas, water, steam, and other liquid and fluid purposes.

When the slide is actuated through the intervention of a rack and pinion, the improvement consists in casting, or otherwise attaching on one or both sides of the rack, which is fastened or cast on the back of the slide or sluice, projections with inclined or by preference plane surfaces. On one or both sides of the pinion, and upon the same spindle, is fixed a cam or eccentric, so arranged that one or both may bear upon these projections when the slide or sluice is in the position for the valve to be called shut. When the valve is open, and it is desired to shut it, a lever or key is applied to the spindle, and turned so as to rotate the pinion gearing in the rack in such a direction as will cause the slide or sluice to pass over or on to its seat, and at the same time bring the projections or plane surfaces under the cam or cams or eccentrics, and so produce a pressure upon the slide or sluice to force and maintain it tightly against the seat until intentionally released. To open the valve the spindle is turned the reverse way, and the pressure is removed by first relieving the pressure of the cam or cams, which is made to take place before the pinion operates upon the rack, owing to the play or back lash provided for at that point in the rack and pinion gear.

A limited effect of the same kind may be produced by reducing the depression between the teeth near the end of the rack, and causing the teeth to "bottom," but the arrangement first described is preferred.

When the sluice is actuated by a screw motion, the screw for raising and lowering the slide or sluice is on the same spidle as the cam or cams or eccentrics. The screwed part of the spindle passes through a nut or half nut on the back of the slide, on which are also the projections for the cam or cams to bear on when the valve is shut, at which moment the projections come into the position to catch the pressure of the cams.

When the valve is to be opened the spindle by proper means is turned the reverse way, and by a slight movement allowed in the nut or half nut the pressure of the cam is removed so as to relieve the slide of all pressure before the screw comes into the position for lifting or traversing the slide.

It is also proposed, when necessary, that in valves which are operated by a screw, curved projections shall be cast on the back of the slide or sluice, and on the body of the valve corresponding projections shall be cast, which will come in contact with the projections on the back of the slide when the valve is being closed, and will have the effect of forcing the slide against the face or seating when it covers the opening in the valve.

A spring or springs may be fixed on the front of the slide, which will be depressed when the slide is forced against the face or seating, and have the effect of pressing the slide away from the face while it is being opened or raised.

892.—TAYLOR, F. B., Bayswater, London, "*An improved steam-engine, also applicable for use as an air, water, or other fluid motor.*" Patent dated March 10, 1875.

The peculiar feature of this invention is the rotation of ordinary cylinders and pistons and parts connected therewith around a stationary crank to which the pistons are connected.

902.—CAREY, R., Suffolk Grove, Southwark, and PORTER, R., Fenchurch Street, London, "*Improvements in valves for regulating the flow or discharge of gas, water, and other fluids.*" Patent dated March 11, 1875.

According to these improvements the valve is made with a double door or pair of doors placed back to back, instead of with a single door of wedge shape as in ordinary valves. Upon the back of one or both of the doors a projection or projections, preferably ribs or rockers of a curved form, are fixed or cast in such a manner that the projections on the one door shall bear upon, and are jammed upon, the corresponding or opposite part or parts of the other door, when the pair of doors are pressed together into the wedge-shaped chamber formed by the arrangement of the seatings at an angle to each other. By this construction the two doors are caused to adjust themselves freely and accurately to their respective seatings, whatever the angle may be. It is preferred to make the points of contact of the projections at or about the centres of the doors, but these points of contact may be placed more or less distant from the centres when desirable. The rockers may be so fitted on as to be adjusted in relation to the centres of the doors to vary the mean of their distances apart to compensate for wear or otherwise to adjust them.

For the purpose of opening and shutting the double doors together, a rod or shaft is employed, passing through a stuffing-box in the body of the valve. This shaft is connected with both doors by means of a cross-head fitted into recesses in the doors, and may be actuated by a screw or by a rack and pinion outside the valve, or by other suitable means. Or a worm may be formed on the lower end of the shaft to work into corresponding racks upon the backs of the doors, which are kept in their proper positions when moving by means of guides fitted to allow the doors sufficient play to permit of their adjusting themselves easily to their respective seatings.

When the valves are intended to be used for gas, it is preferred to make one seating perpendicular or parallel to the body casting of the valve, and the other at an angle to the same, the door for the parallel seating being pressed out from the other door, and against the seating preferably by means of two spiral springs in order to scrape off all tar or other matter as the doors are moved.

When the valves are to be used for water, it is preferred to make both seatings with the same angle to the plane in which the doors move to open and shut. This is especially desirable when they are to be used under a considerable head of water, as upon the first backward movement of the screw the doors are freely released from their seatings, and can be withdrawn with ease.

The freedom and certainty with which the doors adjust themselves to their seatings prevent any straining of the body of the valve, and the consequent distortion of the seatings so common with the ordinary valves with sliding doors, in fitting which to the precise angle of the seatings, absolute accuracy is practically unattainable.

In fitting the valves, the distances between the two faces or seatings and their relative angles are easily conformed to by raising or lowering, or by filing down the projections or rockers at the back of the doors until the doors assume the proper positions against the seatings.

An indicator is provided, when required, to show the position of the double door. This indicator is a rod projecting through the top of the valve casing, and operated by a screw cut in the worm spindle, and being inside the valve body it cannot be tampered with or altered without taking off the top.

930.—FINDLAY, J., Glasgow, and JACK, W., West Calder, "*Improvements in the destructive distillation of coal, shale, and other bituminous substances, and in the apparatus or retorts employed therefor.*" Patent dated March 12, 1875.

This invention relates to modes and means for effecting a more uniform and perfect distillation of coal, shale, or other bituminous substances in vertical or angled retorts, and to new or improved constructions of these retorts for drawing off and collecting the gases or other vapours or products of the distillation for subsequent condensation and treatment.

The body of the retorts may be of the usual cylindrical, conical, elliptical, round-edged and flat-sided parallel or tapered forms down to the curve of their ordinary bottom, which extends outwards a little in front, or to one side, of the body part and brickwork, and forming a sort of knee-shaped and horizontal, or slightly drooping, residuary discharging mouth fitted with a sealed or close luted door in front. But instead of having the exit duct or ducts for drawing off the gases, as heretofore, large, and at one end only, that is to say, near the top or near the bottom of the retort, the nature and novelty of this invention consist in constructing or forming a number of these openings, all projecting laterally by branches or pipes placed at top and bottom, and intermediately at various heights, and through the wall of the retort, preferably in a vertical plane or row, all leading into one vertical pipe common to all the branches, so that the gases as evolved in the retort would pass either in an upward or downward current to these exit ducts, and thence through the ducts into the vertical pipe, from which they would be led off as heretofore from the bottom into the main receiver leading to the condenser for producing and separating the heavy gases or oils from the light or permanent gases. The ends of these lateral branches and top of the vertical pipe connecting them are fitted with close plugs or caps for removal and for the insertion of a bar to clean the ducts when required. The tops of these retorts are fitted with the usual close or sealed charging lid or cover, and the body or shell from the top downwards to the knee would preferably be made of cast iron in one or more pieces, but it might also be made of fire-clay in one piece or in jointed blocks. The retorts would be built in sets as usual with the heating fires below and flue chambers above and all round the retorts in any of the ways common and well known for the heating of other ordinary retorts by radiation and heat from without.

938.—COOKE, H. W., Stondon Massey, Essex, "*Improved apparatus for pumping or exhausting liquids or gases and forcing fluids.*" Provisional protection only obtained. Dated March 13, 1875.

This invention consists in exhausting liquids or gases or creating a vacuum in any suitable vessel, whereby liquids or gases may be forced to pass along any confined tube, channel, or conduit by the action of an intermittent jet of steam.

943.—TOMEY, J., Aston, "*Certain improvements in water-gauge glasses.*" Provisional protection only obtained. Dated March 13, 1875.

This invention consists of the ordinary glass tube now used, with the addition of one part or half of it being enamelled of a white or any other suitable colour. It is well known that there is a great difficulty, with the transparent glass now in use, in ascertaining the water it contains, but by the application of the enamel it shows it at a glance.

950.—COOKE, J., Langley Old Hall, Durham, "*Improvements in the construction of rotary engines and pumps.*" Patent dated March 15, 1875.

This invention relates to such rotary pumps and engines as are described in patents No. 1279, April 20, 1876, and No. 839, March 6, 1875, granted to the present inventor, and is adapted to such machines as are constructed according to these inventions, in which reduced dimensions, weight, and strain of the parts, and increased stiffness, especially of the shutter, are desirable.

965.—MORGAN-BROWN, W., Southampton Buildings, London, "*Improvements in apparatus for the evaporation or concentration of fluids at high or low temperatures, with or without the application of a current of air or steam.*" A communication. Patent dated March 16, 1875.

This invention consists in evaporating fluids by letting them trickle down vertical or conical tubes, the outer parts of such tubes being heated by steam or fire, and in some cases currents of air, cold or warm, are passed up the interior of the tubes in the contrary direction to falling fluid to assist the evaporation by removing the vapour or adding to the heat of the liquid being evaporated.

994.—HOOD, W. C., Battersea, Surrey, "*An apparatus for regulating the flow of liquids.*" Provisional protection only obtained. Dated March 18, 1875.

In this apparatus the water or other liquid enters through a stop-valve weighted by a lever and weight. A rocking-shaft carrying a cam is placed under the lever, so that the cam when in a certain position will lift the lever and open the valve. The camb is counterbalanced by an adjustable lever and weight, and is worked by a quadrant with adjustable tappets. By means of these the apparatus can be set so that the cam shall release the lever and close the stop-valve at any given point.

999.—BROTHERHOOD, P., Notting Hill, London, "*Improvements in apparatus for forcing or compressing fluids or liquids.*" Patent dated March 18, 1875.

According to this invention a piston is made to travel to and fro in a cylinder, so as to force or compress fluids therein by means of a screw-spindle, screwing through the piston, and rotated alternately in reverse directions by a motor engine. In the arrangement employed by preference, the screw-spindle passes through admission valves opening outwards at each end of the cylinder, and is so arranged that, when the piston is at one end of its stroke, and the screw-spindle is rotated in order to make it travel to the other end of its stroke, the admission valve nearest the piston is opened, and the other one is closed before the piston begins to move.

1040.—HILL, G., Liverpool, "*Improvements in and applicable to gas-meters.*" Provisional protection only obtained. Dated March 22, 1875.

The features of novelty which constitute this invention consist, firstly, in the construction of a simple and efficient gauge or indicator for gas-meters, where water or other liquid is used, and secondly in the construction of a self-acting alarum that will indicate when the water or other liquid is too low in the meter, or when the supply from the meter is shut off or in danger of being shut off.

1053.—RAWLINGS, H., Stamford Street, Lambeth, "*Certain improvements in the construction of filters for the purification of water and other liquids.*" Patent dated March 23, 1875.

The nature of this invention is to provide a means of controlling the currents of liquids passing through any filtering medium and subtance by mechanical arrangements and dispositions in the filtering vessels to attain this result; and to construct portable and table filters on an improved plan, so that storeage of filtered water may be unnecessary. Also to provide a ready means of regulating the flow of water through filters in the total quantity of liquid delivered, and for entirely stopping the flow if required.

1058.—WALKER, W. T., Highgate, Middlesex, "*Improvements in centre valves.*" Patent dated March 23, 1875.

This invention consists in improvements in centre valves for working gas purifiers, chiefly applicable to working gas purifiers on the method described in the patent granted to the present inventor, No. 1992, June 8, 1874. It is also applicable to condensers, scrubbers, gasholders, and to other apparatus used in gas-works, in which valves are required.

In working gas purifiers according to the former patent, it is necessary to provide a slide or other gas valve for each centre valve, in order to prevent foul gas finding a passage from the inlet to the outlet when a purifier had to be bye-passed on one side whilst in action on the other side. But by these improvements the use of these slide or gas valves is entirely dispensed with, thereby not only saving their cost, but avoiding the time, labour, and inconvenience involved in operating them. The use of bends for connecting the main inlet with the centre valve is also avoided.

In applying the improvements to a four-way centre valve suitable for working one purifier, the centre valve is formed with a central main inlet or passage, and the body or lower portion of the valve with four divisions or compartments, one of which is closed in at the top, the gas inlet-pipe opening direct into this covered compartment or division, which is also in communication with the central main inlet. The upper part of the centre valve has three divisions or compartments instead of two only. This arrangement allows of the purifier being worked in a similar manner to that when an ordinary four-way centre valve is employed, but when a purifier has to be bye-passed on one side, it is merely necessary to give the valve half a turn, when the purifier will be put out of action, and the third or additional partition will shut off communication between the inlet and outlet passages of the purifier, thereby avoiding the use of a slide valve, heretofore necessary. By giving the valve a further quarter of a turn, so as to bring the outlet chamber or passage over the closed chamber of the body of the valve, the centre valve will act as a stop valve, as the gas would be entirely shut off.

To avoid the use of bends in entering centre valves for working (for example) four purifiers, three on and one off, the body of the valve is formed with an additional compartment or division, closed in at the top, the gas-main opening direct into this closed compartment or division, which is in communication with the central main inlet, in a similar manner to that before described. This additional compartment renders the valve available as a stop-valve.

1063.—SWANN, J., Old Jewry, London, "*Improvements in gas-burners.*" A communication. Provisional protection only obtained. Dated March 23, 1875.

In these improvements the burners are provided with a cap forming a chamber over the orifice in the burner, the cap having apertures in it to make a communication from the chamber to another chamber on the outside of the latter, through and from which the gas passes directly to the burner.

The burner base is provided with an internal screw-threaded socket at its lower end, for attaching it to the gas-pipe, and with a screw-threaded shank, and a shoulder near its upper end for supporting the inner chamber. The burner base is also provided with a transverse regulating plug for cutting off the flow of gas, the screw and its seat being so constructed that the screw can be made to pass into its seat, so as to be flush with the external surface of the lower portion of the burner base, whereby the ring or collar of a lamp shade can be made to pass over the screw.

1077.—CHALLENDER, J., Manchester, "*Improvements in apparatus for illuminating public clocks, which improvements are also applicable to other illuminating purposes.*" Patent dated March 24, 1875.

The principal object of this invention is to illuminate the whole disc or dial of a church or turret clock with the smallest expenditure possible of gas or other artificial light, and without throwing any shadow thereon from the arbor or spindle which carries the hands.

Immediately behind the dial is placed a reflector having the form of a hollow truncated cone, whereof the truncated end is open and the dial forms the base. Within the point where the apex of the cone would be (if it were not truncated), but outside the plane of truncation, are placed two gas-jets or other lamps (one on each side of the arbor or spindle), and thus it will be evident that the lights being placed within the apex of the cone will be equally reflected all over the dial, whilst at the same time, as they are outside the plane of truncation, the products of combustion from the gas will pass quite clear, and will not tarnish nor soil the reflecting surface.

In some cases it is proposed to place a small concave reflector behind the lights in the centre, and if a very large dial is to be illuminated, a proportionate number of gas or other lights must be employed.

It will be evident that this arrangement is applicable for illuminating any circular, octagonal, or other similar surface, but if it be desired to illuminate a rectangular surface (whether square or oblong), then all that is necessary is to substitute a reflector of a truncated pyramidal form for the cone, placing the lights, as before, within the apex, but outside the plane of truncation, and the system is then applicable to railway signal and other lamps or lanterns, and if an elongated reflector and three, four, or more gaslights are used, it may be employed for lighting or illuminating shop signs, billiard tables, and other useful purposes.

1116.—NICOLAS, J., Hope, near Mold, "*An improved method of and apparatus for carbonising coal, slack, peat, wood, bones, and other like materials subjected to a coking process or to destructive distillation, whereby commercial products are obtained and the vapours and gases utilized.*" Patent dated March 27, 1875.

In carrying out this invention an oven, chamber, or vessel made of fire-brick, iron, or other suitable material, or a combination of iron and fire-brick is used, provided with a range of fire-bars or with openings at the bottom. Dampers are affixed to the bottom of the chamber, so arranged as to regulate the admission of air, and the bars or bottom of the chamber are constructed so that they can be dropped or opened in such a manner as to allow the contents of the chamber to fall out. On the top of the chamber there are apertures capable of being opened or closed at will, and to one of these apertures is connected a pipe which leads to a condenser. The condenser is connected to a purifier, and the purifier to an exhausting force-pump, which propels the incondensable gases to the place where they are to be stored or utilized.

The process of operation is as follows:—The oven being charged, the material is ignited at the bottom, the combustion being regulated by the dampers; all the apertures on the top of the chamber are closed but the one communicating with the exhaust and force pump. The action of this draws away the vapours and gases generated by the ignition of the charge, and the gases passing through the mass disengage other vapours and gases in their passage, which are drawn by the pump through the condenser, and through the purifier if necessary, the incondensable gases being forced to any place where they are required.

When coking coal or slack is the process, or when wood, peat, or bones are being carbonized for their charcoal, the pump is stopped at a certain part of the process, the aperture leading to it being closed; the other apertures are opened, and the charge is thereby allowed to ignite throughout. At a time determined by the experience of the operator, the bottom or bars of the oven are dropped or opened, and the charge under treatment is allowed to fall out into chambers provided for that purpose. If vapours and gases are the only objects sought, the pump works continuously, and the chamber is recharged as the material in it is consumed.

1137.—HEAP, J., Oldham "*Improvements in apparatus and appliances for screwing and tapping bolts, nuts, tubes, and other articles.*" Patent dated March 30, 1875.

According to this invention the bolts, &c., to be screwed are fixed in a revolving disc, and presented successively to the screwing dies and a revolving facing cutter. The die holder is driven by strap pulleys, and has a quick return motion, the strap being shifted self-actingly. The cutter head is driven by a strap and gearing, and the bolt or tube is held in a vice which slides to and fro, the slides of the jaws of the vice crossing each other to obtain compactness. A tap is formed with two plain ends, and is fitted to be turned by each end by two sliding headstocks. The nuts to be tapped are threaded on to one end of the tap, and are held in a groove in a revolving wheel, and when tapped are removed from the other end of the tap, the headstocks being withdrawn alternately.

1161.—INGRAM, J., Oakham, "*Improvements in raising and forcing water and other liquids, and in apparatus for the same.*" Provisional protection only obtained. Dated March 31, 1875.

Water is raised, according to this invention, from a well or other place, by the agency of compressed air forced into an air-tight chamber above the water, by means of a double-action cylinder provided with air inlet and outlet valves at each end, and containing a piston worked by a hand lever or otherwise.

1164.—LYALL, J., Glasgow, "*A new or improved tube expander.*" Provisional protection only obtained. Dated March 31, 1875.

This invention consists by preference of a tool with a parallel screwed central spindle, having a bevelled head formed or fixed on one end, and a moveable or annular bevelled head fitted on to the same spindle, the larger end of each head being towards the opposite ends of the spindle. A slightly tapering hole is bored into the larger or outer end of the moveable head, and a screwed nut fitted on the spindle, having its inner or leading end tapering to suit the tapering hole made in the large end of the moveable head of a small friction clutch. The end of the screwed part of the spindle is reduced to a square, and a short tube is fitted outside the heads, which keeps the rollers in their places with three recesses for retaining the rollers in their proper position. Three rollers are by preference used, with bevelled ends to suit the bevels on the heads.

1165.—HALLSWORTH, S., Armley, and BAILES, R., Woodhouse Carr, near Leeds, "*Improvements in purifying illuminating coal gas, and in the preparation of the means employed therefor.*" Provisional protection only obtained. Dated March 31, 1875.

This invention consists in the preparation and use of certain compounds for the purification of illuminating coal gas.

1. The waste product or residue of iron pyrites, having been previously burnt or calcined for the production of sulphuric acid, or the residue of iron pyrites that may have been piled upon a heap and exposed to the weather for the manufacture of copperas and other purposes, is ground in a mortar mill or other equivalent. About three tons of the residue of iron pyrites in a pulverized state is mixed with about one ton of slaked lime, and about 400 gallons of the liquor which runs from the beds of iron pyrites at copperas works. To them is added about half a ton of sawdust or other equivalent, and the whole thoroughly mixed together.

2. Another compound is prepared as follows:—The commercial article known as copperas, or the copperas sediment known as cool or bottoms or the sediment from the evaporating and neutralizing pans or boilers at copperas works, or the sediment made in the manufacture of nitrate of iron, is dried on a heated floor, or by other suitable means, so as to bring it to a dry powder. About one ton of slaked lime is then mixed with about 400 gallons of the liquor which runs from the beds of iron pyrites at copperas works. About half a ton of sawdust or other equivalent is next added, then about three tons of the dried copperas or sediments, and the whole well mixed together. The refuse lime after being used in the distillation of ammonia, and dried, may be substituted for slaked lime in the before-mentioned compounds, which can be used in the ordinary dry lime purifiers. After using them two or three times, it is found advantageous to moisten the materials with a solution of copperas, or the mother liquor left after the crystallization of copperas, or the liquor which runs from beds of iron pyrites each time the compounds are used. When the liquor used is from the beds of iron pyrites, it is further neutralized with iron turnings, or some other kind of light scrap iron, in order to prevent the acid from acting on the purifiers.

3. Another compound is prepared as follows:—About 25 cwt. of the dried refuse lime from the distillation of ammonia, and about 75 cwt. of the spent residue of iron pyrites in fine powder, and about 10 cwt. of sawdust or other equivalent, are mixed together, and the whole slightly moistened with water before being used. Slaked lime may be substituted for the refuse lime if preferred.

1172.—HOGG, J. B., Edinburgh, "*An improved gas-torch or fire-lighter.*" Patent dated April 1, 1875.

The feature of novelty which constitutes this invention is the tube or barrel having one end either closed and perforated, or open and not perforated, and to which at the other end gas is supplied, and on ignition is applied to a fire, which is thus lighted without the use of any of the combustibles usually employed therefor.

1173.—RADFORD, R. H., Strand, London, "*Improvements in fluid motors, power-engines, and such like apparatus.*" Provisional protection only obtained. Dated April 1, 1875.

These improvements consist in mounting a disc or discs at a suitable angle upon a shaft or axle free to revolve in centres or bearings within a case or chamber. The disc in rotating wabbles in the manner of a drunken or wabbling saw, and the movement described by its periphery is that of a portion of a sphere. The case or chamber for containing the disc is varied in the detail of its form and arrangement in accordance with the purpose for which the apparatus has to be employed, as in fan blowers or exhausters the air would be admitted direct to the disc through side openings and discharged tangentially, and in a pump for raising water the lateral central openings to the fan are enclosed in the usual way. In the application of this invention as a rotary engine or motive-power machine, the case or chamber is suitably provided with admission and discharge valves.

APPLICATIONS FOR LETTERS PATENT.

1034.—KIDD, J., Westminster, London, "Improvements in gas-producing furnaces, and in the methods of utilizing the gases generated therefrom." March 10, 1876.

1057.—MALPHOY, A., Rochester, Kent, "A new water (or any other liquid) meter." A communication. March 11, 1876.

1063.—JONES, H. E., Bow, London, "Regulating and correcting alterations in the pressure of gas flowing through street mains." March 11, 1876.

1071.—MILLER, A., Glasgow, "A new or improved construction of pump or fluid drawing and forcing apparatus." March 11, 1876.

1074.—SAVILLE, G. E., Sowerby Bridge, York, "An improved gas scrubber or washer." March 11, 1876.

1108.—BOULTON, M. P. W., Oxford, "Improvements in apparatus for producing heat by the combustion of inflammable gases or vapours, and for generating the latter." March 15, 1876.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

3254.—MORGAN-BROWN, W., Southampton Buildings, London, "Improvements in the manufacture of ammoniacal salts." A communication. Sept. 17, 1875.

3258.—JUDKINS, C., Fleet Street, London, "Improvements in apparatus for regulating the supply of gas to gas-burners." Sept. 17, 1875.

3260.—SOLEY, G. T., Liverpool, "An improved self-sealing cover or lid for gas and other retorts, manholes, ships side lights, fire extincteurs, vaults, sugar filters, and vessels for containing gases, chemicals, fruits, and other liquids and substances." A communication. Sept. 17, 1875.

3276.—BRAE, J. A., London, "Improvements in pumps, which improvements are also applicable to engines driven by steam or other fluid." Sept. 18, 1875.

3287.—ROWE, J. N., Maine, U.S.A., "Improvements in pumps." Sept. 20, 1875.

4477.—WALKER, W. T., Highgate, London, "Improvements in gas-scrubbers, and in apparatus connected therewith." Dec. 23, 1875.

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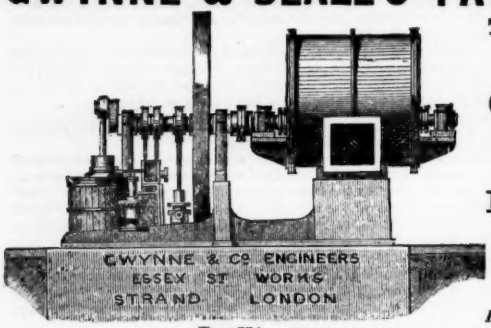

FIG. 224.

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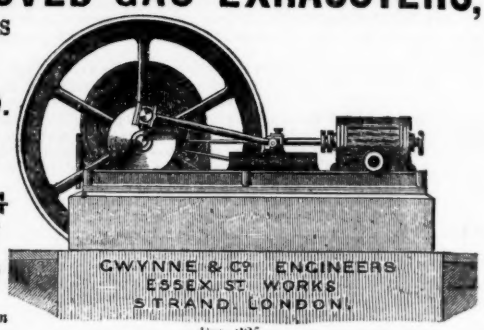

FIG. 225.

Fig. 224 represents one of those erected at the Imperial Gas-Works, Bromley, capable of passing 210,000 cubic feet of gas per hour. Several others of the same size are now on order for the same Company. These Patent Machines combine the highest quality of workmanship and materials, the largest bearings and wearing surfaces, with the **most perfect system of action yet discovered.** Fig. 225 represents one of a series of four at the Nottingham Gas-Works, each passing 62,500 cubic feet per hour. GWYNNE AND Co. *do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, but to produce Machinery of the very highest quality, and the most approved design and arrangement.* Their prices have been estimated with a due regard to the **excellence of the article produced,** and when this is taken into consideration, they have no fear for the result. The orders executed this season for Exhausters and alterations to their patented system amount to over 4,000,000 cubic feet of gas passed per hour, and to over 800 horse power for Engines to drive them. In every instance their work is giving the greatest satisfaction. Numerous testimonials and references can be given.

REGULATORS, BYE-PASSES, STOP-VALVES, GAS-VALVES, & MACHINERY FOR GAS MANUFACTURE, OF ALL SIZES,
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GWYNNE & CO., HYDRAULIC & GAS ENGINEERS, ESSEX STREET WORKS, STRAND, LONDON, W.C.
G. & Co. are now manufacturing for a London Gas Company three of their 210,000 *cubic feet Patent Gas Exhausters, and many of all sizes.*

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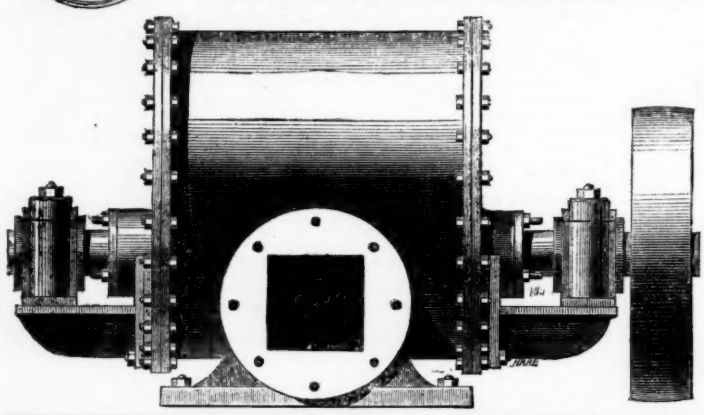

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ABOVE 30,000 OF WHICH ARE NOW IN USE.
"These Lamp-Governors are so superior that they are likely to supplant all others."—*Dr. Wm. Wallace, F.R.S.E., F.C.S.*
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WANTED, by the Advertiser, a situation as GAS-FITTER, Main and Service Layer, Meter Inspector, or to take charge of small works. Good references. Would have no objection to go abroad.
Address, G. K., 2A, George's Place East, Russell Street, BERMONDSEY, S.E.

WANTED, by a Working Manager of a Gas-Work, a SITUATION. Can do main and service laying, meter fixing, gas-fitting, setting of retorts, clay or iron. Twelve years testimonials. Abroad preferred.
Address No. 244, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a Smith who can lay Mains and Services, assist at interior fitting, and make himself generally useful.
Apply, with references, and stating wages, to Mr. GEO. SMEDLEY, Gas-Works, BUXTON.
March 10, 1876.

WANTED, by a practical Gas Engineer, who has for years had the sole management of Gas-Works, where the annual make was over 100 millions, an engagement as ENGINEER or MANAGER. Is thoroughly conversant with all matters appertaining to manufacture and distribution, &c. Testimonials and references of the highest character. Is also open to tender for and lease Gas-Works.
Address No. 256, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by a young Man (aged 20), a situation in a Gas-Work, either as ASSISTANT to the Engineer or Employment in the Office. Has had several years experience, and can forward good testimonials.
Address WALTER KEETLEY, Wanlip, LEICESTERSHIRE.

WANTED, a Set of Three or Four PURIFIERS, about 7 feet square, second hand, in good condition, with the necessary lifting gear, valves, and connexions. Must be cheap.
Apply, with price and particulars, to R. D. COATES, Northallerton, YORKSHIRE.

WANTED, a Working Manager for a Gas-Work five miles from London, making 5 millions per annum. One who understands gas-fitting will have the preference. House, fuel, garden, and gas.
Apply, stating salary, &c., to H. SKOINES, Engineer, Argyle Street, KING'S CROSS, W.C.

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HINTS ON GAS BURNERS, &c.
By MAGNUS OHREN, A.I.C.E., F.C.S.
Specimen Copy by post Threepence, direct from MAGNUS OHREN, Gas-Works, Lower Sydenham, London, S.E.

WANTED, in a large Provincial Gas- Works, a young Man as DRAUGHTSMAN. He must have a good knowledge of gas engineering and building construction. Salary £100 per annum.
Applications, stating age and references, to be sent, on or before March 27, to No. 257, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a situation as Inspector or otherwise, where advertiser can make himself generally useful. Can test wet and dry meters; uses Evans's photometer, Gas Referees sulphur and ammonia tests. Nine years reference in present situation. Provincial works preferred.
Address, TESTER, Post-Office, PORTSMOUTH.

WANTED, a situation as Gas Engineer or Assistant Manager in a Gas-Work. Advertiser is thoroughly experienced in the details of gas manufacture, the construction of works, and is a good draughtsman. Excellent references.
Address, GAS ENGINEER, care of P. Scott, Esq., May Bank, Heaton Road, Withington, MANCHESTER.

WANTED, by the Advertiser, son of a Gas Engineer abroad, under whom he has had three years training, a SITUATION in a London Gas-Work, where he would be willing to give his services free for three months, after which a salary would be expected. Good testimonials.
Address, E. S. WILSON, 8, Hayter Road, BRIXTON, S.W.

WANTED, an intelligent and steady young Man as CLERK, and to collect all water and fitting accounts for the Luton Water Company. Only those who thoroughly understand book-keeping by double entry need apply.

Applications, stating age and salary required, to be sent in at once, addressed to THOMAS F. MIDDLEMISS, Engineer and Manager, Luton, BEDS.

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Consult J. JUDGE, Chemical Burner, who has put up several sets for Gas-Works with success. Saturating Tanks, &c., made to order.

96, New Road, WANDSWORTH ROAD, S.W.

ON SALE, cheap, Four second-hand PURIFIERS, 10 ft. square, with dry centre-valve and lifting gear. Thorncliffe make.

Apply to Mr. LONGWORTH, Dukinfield, MANCHESTER.

FOR SALE, a Set of Four Purifiers, 8 feet square, dry centre-valve, grids, covers, and lifting gear, 8-inch connexions.

Also Two PURIFIERS, 12 feet by 6 feet, two hydraulic valves, grids, covers, 8-inch connexions.

Apply to S. STUDHOLME, Old Gas-Works, WHITEHAVEN.

FOR SALE—A single-lift Gasholder, 60 ft. diameter, 16 ft. deep, with eight cast-iron columns, girders, and guides; also pulleys, rollers, and carriages complete and in good condition. Taken down for further extensions. Can now be seen at work near London.

Apply to Mr. DANIEL HOWARD, Gasholder Works, WEST BROMWICH.

FOR SALE—Four Purifiers. 12 ft. by 8 ft., with 12-in. connexions, hydraulic centre-valve and lifting crane complete; one Station-Meter in square cast-iron case, 10-in. connexions, to pass 10,000 feet per hour; and one 12-in. Governor. All the above are in excellent condition, and may be seen at work previous to their removal, as they are about to be replaced by larger.

Apply to WM. FLEMING, Gas-Works, LANCASTER.

FOR SALE, in consequence of enlarge-ments, Four PURIFIERS, each 6 ft. square, 3 ft. deep, with 9 inches of a lute, centre-valve, and all connexions complete, and made by Hanna, Donald, and Wilson, of Paisley.

Apply to MANAGER, Corporation Gas-Works, LIMERICK.

PURIFIERS FOR SALE.

THE Cardiff Gaslight and Coke Company have FOR SALE Four PURIFIERS, 12 feet square, with four tiers of grids, centre-valve with 15-inch connexions, and apparatus for raising covers. All complete and in thoroughly good order. Will be sold cheap.

Application to be made to HENRY BOWEN, Engineer, Gas Offices, CARDIFF.

March 18, 1876.

THE Gas Committee of the Corporation of Birmingham are prepared to receive TENDERS for the purchase of the SPENT OXIDE produced at their several works in Birmingham and at West Bromwich, for Twelve months, from the 1st of May next.

The quantity is estimated at from 2000 to 3000 tons per annum.

Tenders to be addressed to the Works Committee, not later than the 31st of March.

Further particulars may be obtained on application to the Secretary.

By order of the Gas Committee,
HENRY PARRY, Secretary.

Gas Offices, Old Square, Birmingham, March 1, 1876.

THE Directors of the Gas and Coke Company, Newton Abbot, Devon, require the services of a MANAGER who is thoroughly acquainted with the manufacture and distribution of gas. He will be required to reside in the company's house near the works, to take the meters in the district quarterly, and to make out the accounts for the collector. Also to superintend the laying of mains and services, &c. The coal carbonized is about 600 tons per year.

Further particulars may be obtained from the Secretary, Mr. JAMES CHAPPLE, Bank Street, NEWTON ABBOT, to whom applications, stating salary required, should be made at once. None need apply who cannot give satisfactory references.

THE GASLIGHT & COKE COMPANY.

NOTICE is hereby given that a HALF-YEARLY ORDINARY GENERAL MEETING of the Shareholders in this Company will be held at this Office, on FRIDAY, the 7th day of April next, at Twelve o'clock (noon) precisely, to transact the usual business, including the declaration of a Dividend for the half year ending on the 31st day of December last, and to elect four Directors and three Auditors in the place of those who will at such meeting go out of office.

Notice is hereby also given that at such meeting the Directors will apply to the Shareholders for authority to dispose of such further portion of the Company's property as is not now required for the purposes of their undertaking.

Notice is hereby further given that the Transfer Books of the Company will be closed on Friday, the 24th inst., and reopened immediately after the above meeting.

By order,
JOHN ORWELL PHILLIPS, Secretary.

Chief Office, Horseferry Road, Westminster, S.W.,
March 14, 1876.

COMMERCIAL GAS COMPANY.—NOTICE is hereby given that the next ORDINARY MEETING of the Company will be held at the London Tavern, Bishopsgate Street, in the City of London, on FRIDAY, the 7th day of April, 1876, at Twelve o'clock at noon, to receive the Report of the Directors, to declare a Dividend, and for other business of the Company.

A Resolution will be submitted to the meeting empowering the Directors to raise additional capital.

The Books of the Company will be closed for the Transfer of Stock from the 23rd day of March to the 7th day of April now next ensuing.

By order of the Board,
GEORGE JAQUES, Secretary.

Stepney, March 14, 1876.

SOUTH METROPOLITAN GASLIGHT AND COKE COMPANY.

NOTICE is hereby given that the ORDINARY HALF-YEARLY GENERAL MEETING of the Proprietors of this Company will be held at the London Tavern, in the City of London, on MONDAY, the 3rd day of April next, at Two o'clock precisely, to receive the Directors Report and the Accounts of the Company for the half year ending Dec. 31 last, to declare a Dividend, and to elect a Director in the place of Captain Heathorn, R.A., and an Auditor in the place of Frederic Simpson, Esq., who retire from office at this meeting, but, being eligible, offer themselves for re-election.

Any Proprietor holding forty shares, intending to become a candidate for either of these offices, must give notice in writing at the Office of the Company at least fourteen days previously to the day of election.

By order of the Board,
GEORGE LIVESEY, Secretary and Engineer.

589, Old Kent Road, S.E., March 11, 1876.

The Transfer Books of the Company will be closed from the 18th of March until after the meeting.

TOTTENHAM & EDMONTON GAS-LIGHT and COKE COMPANY.

NOTICE is hereby given that a GENERAL MEETING of Shareholders will be held at the Works, Willoughby Lane, Tottenham, on SATURDAY, the 1st day of April next, at Three o'clock in the afternoon precisely, to receive the Report of the Directors, and to declare an interim Dividend.

The Transfer Books of the Company will be closed from the 18th of March to the 3rd of April inclusive.

By order of the Board,
JAMES RANDALL, Secretary.

Edmonton, March 17, 1876.

TO MANUFACTURING CHEMISTS AND OTHERS.

THE Directors of the Stratford-upon-Avon Gas Company invite TENDERS for the whole of the AMMONIACAL LIQUOR and the surplus TAR produced at their works for One, Two, or Three years. Accommodation for loading either by rail or canal. Tenders received up to the 31st inst.

The Directors reserve the right of accepting the highest or any tender.

For further information apply to J. S. CRANMER, Manager.

TO TAR DISTILLERS AND MANUFACTURING CHEMISTS.

THE Directors of the West Kent Gas Company invite TENDERS for the whole of the AMMONIACAL LIQUOR and surplus TAR produced at their Works, Erith and Crayford, for One, Two or Three years. Tenders received up to the 30th inst.

The Directors do not bind themselves to accept the highest or any tender.

Further information can be obtained of the SECRETARY, at his Office, 237, Southwark Bridge Road, LONDON.

VALUABLE SHARES IN THE BOURNEMOUTH GAS AND WATER COMPANY.

MESSRS. ABBOTT AND SON are favoured with instructions to SELL BY AUCTION, at the Auction Mart, Old Christchurch Road, Bournemouth, on Thursday, March 30, 1876, at Three o'clock, 179 £10 SHARES in the Bournemouth Gas and Water Company. They will be sold in lots of Ten each. The growing prosperity of this fashionable watering-place is sufficient to recommend these Shares as a good investment.

Particulars, with conditions of sale, may be obtained of W. CASH, Esq., Secretary of the Company, 26, Nicholas Lane, LONDON; of Mr. E. W. REBBECK, Estate Agent, BOURNEMOUTH; or of Messrs. ABBOTT AND SON, BOURNEMOUTH and CHRISTCHURCH.

SPONGY IRON FOR THE PURIFICA-TION OF GAS AND WATER.

BROOKE, SIMPSON, AND SPILLER, of 50, Old Broad Street, E.C., have purchased a patent for, and commenced the manufacture of, this product, and are prepared to enter into contracts for delivery.

G. A. BAILEY AND CO., Machinists, Manufacturers of all kinds of Indexes for Gas and Liquid Meters, Tell-Tales for Turnstiles, on an improved principle. Every description of Wheel and Worm Cutting any size, &c.

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By THOMAS NEWBIGGING, A.I.C.E.

The scope of this work is apparent from its title. The First Edition, published a few years ago, was eagerly sought for, and has been now for some time out of print. The favourable reception accorded to it sufficiently proved that it supplied a generally acknowledged want in the profession. The work has undergone careful revision; much new matter has been added; and the New Edition is published in fcap. 8vo., morocco, gilt.

"This may be fairly described as among the most useful manuals of its class."—*Iron.*

"Gas managers will find it a very useful companion."—*Chemical News.*

"The new edition is published in a small octavo form, which makes it a handy book, either for the pocket or the desk."—JOURNAL OF GAS LIGHTING.

"An excellent little book."—*Mr. R. H. Patterson (late Gas Referee) in the* JOURNAL OF GAS LIGHTING *April* 28, 1874.

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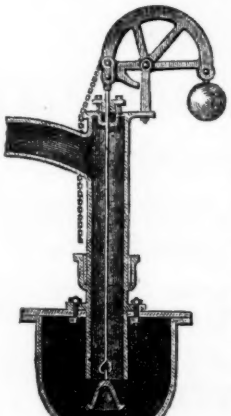


BOX'S
PATENT ANTI-DIP VALVE

Affords a clear gas way through the dip-pipe while the retort is in action, and produces a perfect seal at pleasure, or whenever the retort is open, offering absolute security against the drawing of air, however hard the engine is worked, and obviating the necessity for using any liquid in the now so-called hydraulic main, while it is at the same time capable of withstanding the heaviest back pressure. By its use, experience shows that the retorts are kept quite free from carbon. It is easy of application to existing apparatus, and is comparatively inexpensive. Is not likely to get out of order, as the tar, which will adhere to the bottom of the dip-pipe and the flange of the cone, both of which are faced, will act as a lubricant, and prevent undue wear and tear. The whole, as will be seen on inspecting the accompanying illustration, is exceedingly simple, and every part accessible. To adapt it to the present dips, all that is necessary is to face the bottom edge of the dip-pipe, and suspend a cone by a rod, which passes through the bonnet, the raising and lowering of the cone being performed through the intervention of a weighted eccentric and chain.

The Patentee will be glad to show a number of the Patented Apparatus in action, is prepared to supply them upon the most moderate rerms, and will be happy to reply to any inquiries that may be addressed as under—

W. BOX,

GAS-WORKS, CRAYFORD, KENT.

THE Sheffield United Gaslight Company have for SALE the following Articles:—

The whole Manufacturing Plant, Gasholder, and Governor, of a small Gas-Work, capable of producing 10,000 cubic feet of gas per day. The gasholder is 27 ft. diameter by 14 ft. deep, cubic contents 8000 ft.

Connexions for ditto.

Four Purifiers, 12 ft. square, with 10-in. centre-valve and connexions.

Two Jones's Exhausters, each to pass 25,000 cubic feet per hour, with valves and connexions, in good condition.

Two 7-in. Governors.

One Battery Condenser, 60 ft. long, 12 ft. high, and 2 ft. wide, with 14-in. connexions and valves.

Seven Lengths Hydraulic Main, 7 ft. long, 18 in. diameter.

Nine Lengths Hydraulic Main, 7 ft. long, 14 in. diameter.

Twenty-seven Dip-Pipes, 4 in. diameter.

Twenty-seven Bridge-Pipes, 4 in. diameter.

Full particulars as to quality and price can be obtained on applying to Mr. T. ROBERTS, the Manager, Commercial Street, SHEFFIELD.

TO CONTRACTORS.

THE Directors of the Town of Dudley Gaslight Company invite TENDERS for the construction of a brick GASHOLDER-TANK, 113 ft. in diameter and 31 to 32 ft. deep.

Specification and Drawings may be seen and copied on application at the Company's Office, on the works, on and after the 16th inst.

Sealed tenders, endorsed "Tender for Gasholder-Tank," and addressed to the Chairman and Directors of the Town of Dudley Gaslight Company, to be sent in on or before Tuesday, the 28th inst.

The Directors do not bind themselves to accept the lowest or any tender.

T. COLLETT, Secretary.

Gas-Works, Dudley, March 8, 1876.

TO CONTRACTORS, BUILDERS, AND OTHERS.

THE Gas Committee of the Bury Improvement Commissioners are prepared to receive TENDERS for the excavation and construction of a BRICK TANK, 123 ft. diameter and 35 ft. deep.

Plans and specification may be seen, and form of tender obtained, at the Gas-Works, Bury, on and after Tuesday, the 14th day of March.

Sealed tenders, endorsed "Tender for Gasholder-Tank," to be delivered on or before the 30th day of March, addressed to the Clerk of the Bury Improvement Commissioners.

The Gas Committee do not bind themselves to accept any tender.

JOSEPH WOOD, Engineer and Manager.

Gas-Works, Bury, March 7, 1876.

WIDNES WATER-WORKS.

THE Widnes Local Board are prepared to receive TENDERS for the construction of a covered RESERVOIR (to contain 10 million gallons), to adjoin their present one on Pex Hill.

Plans may be seen, and specification and quantities obtained, upon a payment of two guineas (which will be returned upon receipt of a *bonâ fide* tender), at the Engineer's Office, Public Offices, Widnes, on and after the 15th inst.

Tenders to be addressed to the Chairman of the Gas and Water Committee, endorsed "Reservoir," and delivered at the above Offices not later than Ten a.m. upon the 3rd of April next.

The Board not bind themselves to accept the lowest or any tender.

HENRY ROBERTS.

Widnes, March 7, 1876.

TO GAS CONTRACTORS AND OTHERS.

PORTMADOC GAS-WORKS.

THE Portmadoc Gas Company, Limited, are prepared to receive TENDERS for a LEASE of their GASOMETER and WORKS, for either 7 or 14 years, from the 1st day of October, 1876. Any person or company wishing to tender can receive particulars from the Secretary.

Sureties will be required.

Tenders must be sent in on or before the 1st of May next.

JOB THOMAS, Secretary.

Company's Offices, Portmadoc, March 7, 1876.

STOCKPORT BOROUGH GAS-WORKS.

TO CONTRACTORS, BUILDERS, AND OTHERS.

CONTRACT No. 1.

THE Gas Committee of the Corporation of Stockport are prepared to receive TENDERS for the excavating and building of a BRICK TANK, 144 ft. 6 in. diameter and 33 ft. deep, for their new works, Portwood, Stockport; also a Rubble Stone RETAINING WALL, about 100 yards long.

Drawings and specifications may be seen on application at the Heaton Lane Works, Stockport.

Sealed tenders to be sent in on or before Wednesday, April 5, addressed to the Chairman of the Gas Committee, and endorsed "Tender for Tank and Wall."

The Committee do not bind themselves to accept the lowest or any tender.

Further particulars may be obtained from the Engineer.

By order,

JAS. JACQUES, Engineer and Manager.

Millgate Works, March 9, 1876.

STOCKPORT BOROUGH GAS-WORKS.

TO GASHOLDER MAKERS AND OTHERS.

CONTRACT No. 2.

THE Gas Committee of the Corporation of Stockport are prepared to receive TENDERS for the supplying, fixing, and completion of a Telescope GASHOLDER, the inner lift being 140 ft. diameter and 32 ft. 6 in. deep, with all necessary guides, wheels, columns, and girders complete, to be erected at their new works, Portwood, Stockport.

Drawings and specifications may be seen on application at the Heaton Lane Works, Stockport.

Sealed tenders to be sent in on or before Wednesday, April 5, addressed to the Chairman of the Gas Committee, and endorsed "Tender for Gasholder."

The Committee do not bind themselves to accept the lowest or any tender.

Further particulars may be obtained from the Engineer.

By order,

JAS. JACQUES, Engineer and Manager.

Millgate Works, March 9, 1876.

ALFRED WILLIAMS,

PHŒNIX FIRE-BRICK WHARF,

64, BANKSIDE, SOUTHWARK, LONDON, S.E.

GAS ENGINEER AND CONTRACTOR FOR THE ERECTION OF GAS-WORKS,
AND FOR THE
SUPPLY OF RETORTS, FIRE-BRICKS, CAST-IRON MAINS,
AND ALL MATERIALS FOR GAS MANUFACTURE AND DISTRIBUTION.

GEORGE ORME & CO.,

ATLAS METER-WORKS, OLDHAM,

MANUFACTURERS OF

WET AND DRY GAS-METERS,
STATION-METERS, GOVERNORS,
PRESSURE AND EXHAUST REGISTERS,
LAMP-METERS IN CAST-IRON BOXES,
And every Description of Gas Apparatus.

B. GIBBONS, JUN.,

DIBDALE FIRE-CLAY, BRICK, AND GAS-RETORT WORKS,

STOURBRIDGE (Established 1834),

MANUFACTURER OF EVERY DESCRIPTION OF

Burs, Lumps, Stays, Shields & other Bricks, & Gas-Retorts,

A LARGE QUANTITY OF RETORTS ALWAYS IN STOCK.

Circular .	14 in.,	15 in.,	16 in.,	18 in.
Ovals . .	17 in. × 14 in.,	17 in. × 15 in.,	20 in. × 15 in.,	21 in. × 15 in., &c.
D's. . .	14 in. × 14 in.,	15 in. × 12 in.,	15 in. × 13 in.,	17 in. × 14 in., 18 in. × 13 in.
	18 in. × 15 in.,	20 in. × 16 in.,	22 in. × 14 in.,	24 in. × 14 in., 24 in. × 15 in., &c.

Special attention given to the execution of Export Orders.

CLYDE TUBE WORKS, GLASGOW & COATBRIDGE.

OFFICES, 41, OSWALD STREET, GLASGOW,

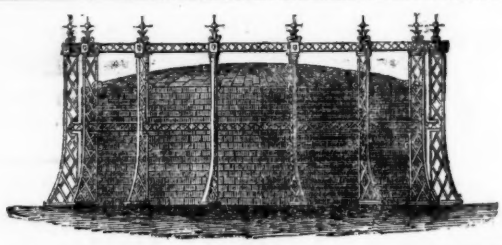
ANDREW & JAMES STEWART,

MANUFACTURERS OF

WROUGHT-IRON WELDED TUBES AND FITTINGS,
GUN METAL & OTHER COCKS, ALL KINDS OF IRON & BRASS FITTINGS
For GAS, WATER, and STEAM;
CAST-IRON PIPES, CORE BARS for IRONFOUNDERS,
STOCKS, DIES, and TAPS, GAS PLIERS and TONGS, &c., &c.,
ALWAYS KEPT IN STOCK.

LAP-WELDED IRON BOILER TUBES,

As supplied to the English, French, and Dutch Admiralties, and principal Railways and Engineers at Home and Abroad.



THE HORSELEY COMPANY,

LIMITED,

TIPTON, STAFFORDSHIRE.

LONDON OFFICE:

6, WESTMINSTER CHAMBERS, VICTORIA STREET,

GAS ENGINEERS, IRONFOUNDERS, &c.,

MANUFACTURERS OF

GASHOLDERS, WROUGHT AND CAST IRON TANKS, CONDENSERS, PURIFIERS, SCRUBBERS, MAINS, RETORT-LIDS, PLAIN AND DISHED, LAMP-POSTS, PIPES,

AND ALL REQUISITES FOR EITHER

GAS OR WATER WORKS;

ALSO

MAKERS OF ROOFS, BRIDGES, &c.

KÖRTING BROS.,

Steam-Jet Engineers,

SOLE LICENSEES FOR

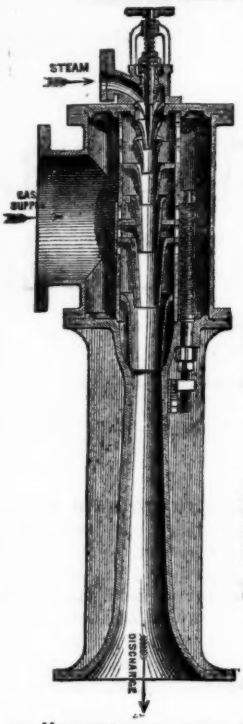
W. CLELAND'S PATENT STEAM-JET GAS-EXHAUSTER,

AND

W. CLELAND'S PATENT STEAM SCRUBBER,

7 and 17, LANCASTER AVENUE, MANCHESTER.

Germany: Cellerstr. 35, Hannover.
Austria: Kolring., Pestalozzigasse 6, Vienna.
France: 11, Rue Louis-le-Grand, Paris.
U. S.: 1645, N. 10th St., Philadelphia.



E. KÖRTING'S PATENT

STEAM-JET GAS-EXHAUSTER.

Small Cost—Compactness—Perfectly Self-Acting—
Self-Regulating—Self-Cleansing—No Steam-Engine—No Attention—
No Extra Room Required—No Wear and Tear—No Noise—
No Oscillation in Vacuum, or Back Pressure.

UPWARDS OF 200 IN USE.

SUPPLIED TO—

Chartered Gas Co.	Horsham Gas Co.	Bury Gas-Works.
London Gas Co.	Epsom and Ewell Gas Co.	Glasgow Corporation.
S. Metropolitan Gas Co.	Ipswich Gas Co.	Leyland Gas Co.
Phœnix Gas Co.	Cheltenham Gas Co.	Stalybridge Gas-Works.
Liverpool Gas Co.	Sandwich Gas Co.	Lincoln Gas-Works.
Bolton Corporation.	Cornholme Dis. Gas-Wks.	&c., &c., &c.

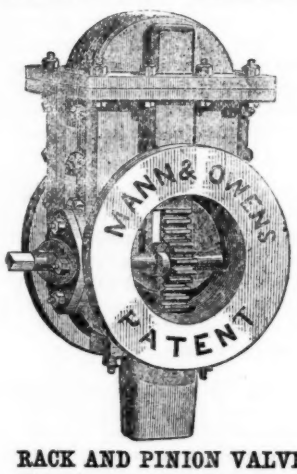
E. KÖRTING'S PATENT STEAM-JET REVIVIFYING BLOWERS FOR THE PURIFYING MATERIAL.

W. CLELAND'S PATENT STEAM SCRUBBER,
Combining small cost and thorough efficiency, with absence of any mechanical means and necessity of renewing the scrubbing material.

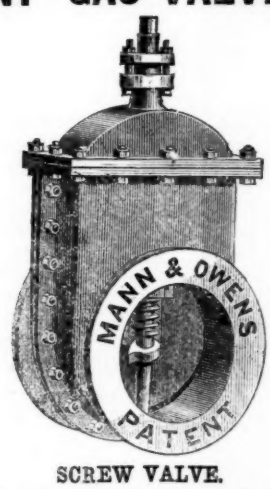
FOR PARTICULARS, APPLY TO

KÖRTING BROS., 7 and 17, Lancaster Avenue, MANCHESTER,
OR TO
GERALD J. TUPP, 8, John Street, Adelphi, W.C., LONDON,
SOLE AGENT FOR ENGLAND AND WALES.

MANN & OWENS' PATENT GAS-VALVE.



RACK AND PINION VALVE.



SCREW VALVE.

The advantages of this Patent Valve over all others yet introduced are, that it is always as tight as the best wedge or spring valve, without the possibility of setting fast or becoming suddenly leaky. The surfaces not being in contact during the operation of opening or closing, leakage through wear and tear is avoided.

The Gas Engineer will not fail to see the importance of such a valve in connexion with his purifying apparatus, particularly in the case of large sizes.

The slide being operated either by a screw and nut, or by a pinion and rack, a cam bearing upon a plane, cast on the back of the Valve, forces it against the face, and renders the escape of gas an impossibility. By a slight turn of the pinion or screw, the slide is released, and brought away from the face, by which means friction is avoided, and the only force required to open the Valve is that due to its own weight.

SOLE MANUFACTURERS:

S. OWENS AND CO.,

HYDRAULIC AND GENERAL ENGINEERS,

WHITEFRIARS STREET, LONDON, E.C.

PRICES, SIZES AND FULL PARTICULARS ON APPLICATION.

BRISTOL UNITED GASLIGHT COMPANY.

SPECIFICATION AS TO SUPPLY OF COALS.

THE Directors of the Bristol United Gaslight Company invite TENDERS for the supply of from 90,000 to 100,000 tons of GAS COALS, during the Twelve months between the 1st of May, 1876, and the 1st of May, 1877, for use at the works, situate respectively at Avon Street, St. Philip's, and Canons' Marsh, Bristol.

The Coal to be partly small and partly large or brush, and to be delivered in such monthly proportions as may be required in accordance with the season. The quality of the coals must be good, dry, and free as possible from sulphur, bats, binds, refuse, and dirt.

Full particulars required of the Coals for which tenders may be submitted, and the Directors will be glad to receive chemical analyses thereof, and any information in relation to their properties for the manufacture of gas.

Parties tendering must state the maximum quantities of either small, large, or brush Coal they will undertake to deliver monthly, and it must be understood that the Directors are to be at liberty to accept the terms offered for any lesser quantities they may think fit.

Tenders to state the prices per ton f.o.b. (port of shipment to be named), or delivered at Railway Station, Bristol, or at the Company's Gas-Works, Avon Street or Canons' Marsh, and discount for cash monthly payments.

Payment will be made in accordance with the weight (20 cwt. to the ton), as weighed upon the weigh-bridge of the Gas Company at their respective stations.

Sealed tenders to be addressed to the Chairman of Directors, Bristol United Gas Company, Canons' Marsh, Bristol, marked "Tender for Gas Coal," and delivered not later than Tuesday, the 28th of March inst.

HENRY H. TOWNSEND, Secretary.
Gaslight Offices, Bristol, March 3, 1876.

T. NEWBIGGING,

CONSULTING GAS ENGINEER,

5, NORFOLK STREET, MANCHESTER.

Mr. ALFRED LASS,

60, CORNHILL, LONDON, E.C.,

Is prepared to open the Books, and, if necessary, keep the Accounts of Gas and Water Companies.

To examine the Books and Accounts, and prepare Balance-Sheets for the information of Directors.

To assist Secretaries in preparing Balance-Sheets, according to the "Gas-Works Clauses Act, 1871;" or may be consulted with respect to Accounts generally.

D. M. NELSON,

48, GORDON STREET (late 135, BUCHANAN ST.), GLASGOW,

Supplies every requisite in connexion with the distribution of Gas and Water.

Estimates and prices on application.
WOOD GRIDS for Purifiers and Scrubbers.
Cast-Iron PIPES and VALVES.
Street LAMP-PILLARS.
Patent Pipe SCREWING-MACHINES, &c.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.

Patents procured for Foreign Countries.

Information as to cost, &c., supplied gratuitously upon application to the Advertiser, 22, Great George Street, WESTMINSTER.

BAILEY'S Patented Inventions are now in extensive use wherever steam is known. Bailey's Patent Steam Gauges, Pyrometers, Water Gauge Cocks, Test Pumps, Fusible Plugs, Steam and Water Valves, Safety Valves, Junction Valves, Pumps, Tell-Tales, Recorders, Lightning Conductors, Electric Telegraphs, Turret Clocks, Steam Joint Cement, Lifting Jacks, Boiler Feeders, Lime Catcher and Separator, Injectors and Ejectors, and every description of first-class Brass Work for Engines and Boilers. Gas-Works Managers who have not our large book should send for it.

16th edition, 1000 engravings, 4to., post free 2s. in stamps, weight 10 oz., cost of production £1000,

BAILEY'S Illustrated Inventions, containing details and prices of goods in our five several departments:—(1) Brass Foundry, Steam Gauges, Indicators, Feeders, and Fittings; (2) Engineers Sundries, Small Tools, and Stores; (3) Machine Pump and Fire Engine; (4) Turret Clock, &c.; (5) Electric Telegraph, A B C Instruments, Bells, and Apparatus.

J. BAILEY and Co., Albion Works, Salford, LANCASHIRE.

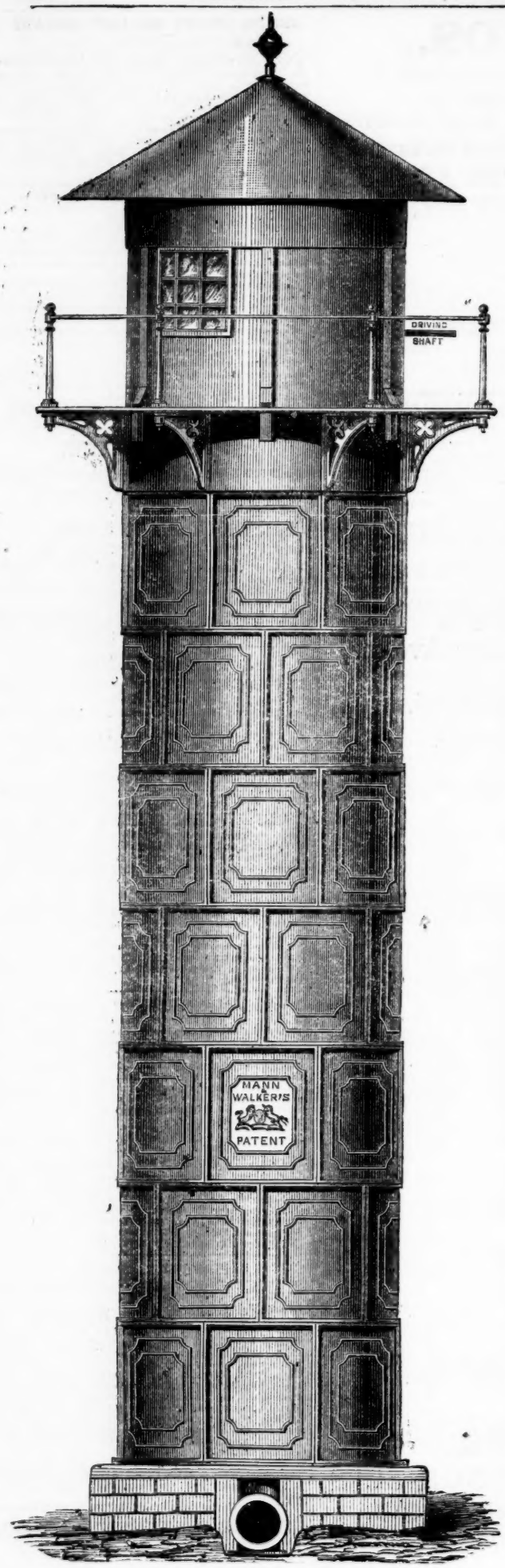
IN THE MATTER OF

BRONNER'S GAS-BURNERS.

HENRY GREENE AND SON, 155, Cannon Street, London, Sole Agents for Great Britain, Ireland, and Colonies, of Brönner's Improvements in Gas Lighting, beg to inform the public that on the 13th of January, 1876, Julius Brönner obtained an injunction in the Court of Session, Scotland, against Donald M'Vean, Gas-Fitter, 14, Newton Street, Glasgow, prohibiting him from in any way advertising or offering for sale as Brönner's Burners, any Burner not manufactured by Julius Brönner, or from in any way inducing the public to believe that the said Donald M'Vean sells or keeps for sale Brönner's Burners, manufactured by Julius Brönner, while such is not the case.

Also that on the 9th of November, 1875, he obtained injunction in the same Court, and in the same terms, against R. M. Brechin and Co., 46, North Hanover Street, Edinburgh.

Also that on the 20th of April, 1875, in a suit in Chancery, before Vice-Chancellor Malins, number 1874, B 365, he obtained injunction against another defendant, in the same terms and on similar grounds.



C. & W. WALKER,
8, Finsbury Circus,
London, E.C.

MANN & WALKERS' PATENT SCRUBBER.

By Letters Patent in Great Britain, Europe, and the United States of America.

By some important improvements recently patented, the purifying power of these Scrubbers has been much increased, and a stronger ammoniacal solution obtained, which is found to absorb a large portion of the carbonic acid contained in gas, effecting an important saving in money and labour in the lime purifiers, and where oxide only is used, the increase in the illuminating power of the gas obtained by these Scrubbers is shown in a remarkable degree, in consequence of the large quantity of carbonic acid removed from the gas.

It is to be particularly noted that the important results of these Scrubbers do not depend upon the machinery alone. The entire internal construction of the Scrubber bears an almost equally important part. For this reason, where it is desirable to convert existing Scrubbers, whose dimensions happen to be suitable, the work commences by ripping out the whole of the interior of the shell, and beginning the internal construction *de novo* from bottom to top.

They are, in all cases, constructed under guarantees to perfectly perform their work. They are now extensively used in the largest gas-works of London and the chief cities of Europe, the number in use exceeds **one hundred,** and their perfect efficiency and profit to a gas company have been fully established with every variety of coal used in Europe. References can be given to the largest gas-works in Europe.

By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade, relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals, generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

They contain their own engine power, requiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

Applications relating to dimensions and prices should be addressed to us, C. and W. Walker, 8, Finsbury Circus, London, E.C., or to Mr. William Mann, late Superintendent of the Chartered Gas-Works, Blackfriars, London; they should state approximately the largest make of gas in 24 hours on a winter's day, and the smallest make on a summer's day, to be purified.

J. & J. BRADDOCK,

GAS ENGINEERS,

GLOBE METER-WORKS, OLDHAM,

MANUFACTURERS OF

WET & DRY CONSUMERS GAS-METERS,

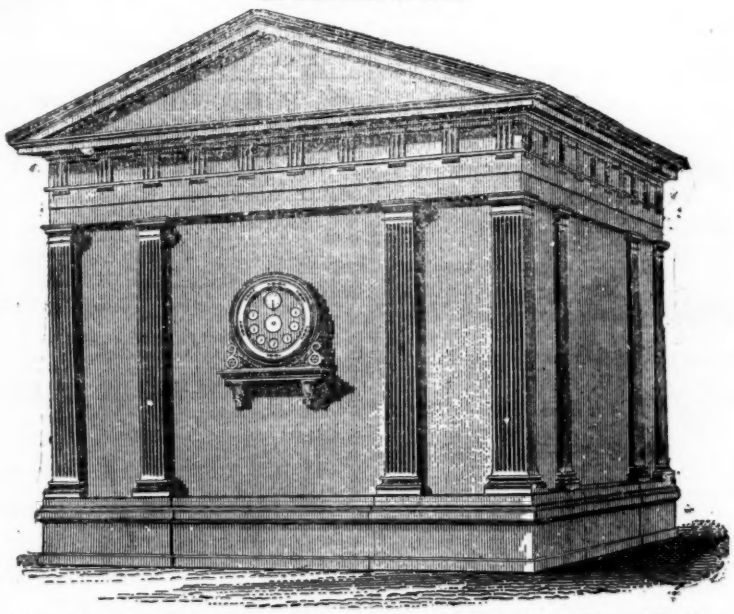
OF THE HIGHEST EXCELLENCE;

ALSO LICENSEES AND MANUFACTURERS OF

WARNER & COWAN'S PATENT SELF-REGULATING GAS-METERS;

ROUND STATION-METERS,

ON CAST-IRON STANDS.



SQUARE STATION-METERS,

WITH PLANED JOINTS.

GOVERNORS, GAUGES, INDICATORS, MAIN COCKS, &c.

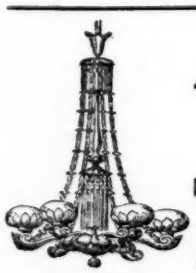
GAS COOKING APPARATUS.

Home and Foreign Orders promptly attended to.

All Sizes of CONSUMERS METERS, STATION-METERS, and GOVERNORS generally in Stock.

Orders almost invariably despatched on the day of receipt.

TERMS, &c., ON APPLICATION.



F. & C. OSLER,

45, OXFORD STREET, LONDON, W.

MANUFACTORY AND SHOW-ROOMS:

BROAD STREET, BIRMINGHAM.

ESTABLISHED 1807.

MANUFACTURERS OF CRYSTAL GLASS CHANDELIERS,

WALL LIGHTS, AND LUSTRES FOR GAS AND CANDLES.

TABLE GLASS OF ALL KINDS.

CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.

GEORGE ANDERSON,

GAS AND CONSULTING ENGINEER,

35A, GREAT GEORGE STREET,

WESTMINSTER, S.W.

PATENTEE and MANUFACTURER of the following Inventions:—

RETORT SETTINGS—giving great Economy of Fuel.

STEAM-ENGINES and EXHAUSTERS, FOUR-WAY VALVES.

FUEL-MACHINE, for Compressing Breeze and Tar.

WASHERS, SCRUBBERS, and PURIFIERS, that Economize Space and Cost.

N.B.—Pamphlet, with Eighteen Illustrations of the foregoing, with letterpress on the construction of Gas-Works, post free, 2s. 6d.

COST PRICE SHEETS.

MANUFACTURE AND DISTRIBUTION OF GAS. These sheets are the same as were laid before the Dublin Meeting of the British Association of Gas Managers; but in the REPRINT, NOTES have been added for the guidance of those using them. Copies of the two sheets may now be had, price 5s.
South Shields. W. J. WARNER.

SZERELMEY Liquid Enamel, for Iron-work exposed to the atmosphere, supersedes paint, dries in two hours, absolutely prevents rust, contains no oil, requires no mixing, is ready for use, is laid on like paint, covers new or old iron or wood, old paint, tar, or whitewash, is waterproof, gives a fine polished surface, and costs scarcely one-fourth as much as paint—namely, one halfpenny per square yard. Samples to any address for 12 stamps. Particulars free on application.

SZERELMEY Iron Paint has stood the test of 24 years experience. The gilding on the Victoria Tower of the Houses of Parliament was laid on over it upwards of 20 years ago, and is still in perfect condition.

SZERELMEY Stone Paint thoroughly waterproofs brick and other walls without giving them the appearance of having been painted.

COPIES of Reports on the Szerelmey compositions, by Sir Charles Barry, Sir R. J. Murchison, and Professor Faraday (printed by order of the House of Commons), with other information, may be had on application.

NONE of the Szerelmey compositions contain white or red lead, arsenic, or any other injurious ingredient. When in use and while drying they have a purifying effect on the atmosphere.

SZERELMEY Liquid Enamel.—The cost of the Enamel when laid on is about one halfpenny per square yard. We are now entering orders for execution at any time before the end of March, at £25 per ton, subject to a liberal discount for cash, particulars of which we will send, if asked. A ton measures about 125 gallons, and is ready for use.

SHIPPERS will receive liberal treat- ment at our hands. They will find that our Enamel paste can be supplied for shipment at a price with which no ordinary paint can compete.

SZERELMEY Debentures.—Investors desirous of subscribing for the remainder are requested to intimate their intention as early as possible. The debentures will be dated Jan. 1, 1876; from that date interest at 8 per cent. per annum (for which coupons are attached) will be paid quarterly. No prospectus will be advertised, but full particulars will be sent in reply to any application addressed to N. C. SZERELMEY AND COMPANY, Limited, 24, City Bank Chambers, Threadneedle Street, LONDON, E.C.

PRICE'S PATENT COKE & COAL BARROW

effecting a great saving of time, labour, and expense.
For particulars, price, &c., apply to Mr. E. PRICE, Inventor and Patentee, Gas-Works, Hampton Wick, MIDDLESEX.

ADDISON POTTER,

WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE,
Manufacturer of

CLAY RETORTS, FIRE-BRICKS, AND EVERY DESCRIPTION OF FIRE-CLAY GOODS

BELGIAN CLAY RETORTS.

J. SUGG and CO., late ALBERT KELLER, GHENT.—The removal of the import duties on Earthenware permitting the entry of Clay Retorts into England, Messrs. Sugg, of Ghent, beg to draw the attention of the Gas Companies of London, and other Cities, to the very superior quality of the RETORTS manufactured by them. They can be made of any size, in one piece, and of any form. The price will be in proportion to the weight, and very moderate in comparison to their value.
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Owner of the Works at which Fire-Clay Retorts were first made), can supply

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References can be given to managers of above a hundred Gas-Works whom he supplies.
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CELEBRATED HALBEATH STEAM COALS,
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(Established 1820,)

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LOTHIAN'S CANNEL
Yields 12,500 cubic feet of 34-candle gas per ton, and 9 cwts. of excellent coke, containing only 4 per cent. of ash.

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COPPA COLLIERY, MOLD,
Beg leave to call the attention of Gas Companies to the superior quality of their
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This Cannel produces in actual working, in iron retorts, 9200 cubic feet of 32-candle gas, and upwards of 11 cwt. of coke, and in clay retorts will produce 11,500 cubic feet of 25·9-candle gas.
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Waggons supplied for delivery by railway to any part of England or Wales.
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Cubic feet of Gas yielded per ton . . .	10,050
Illuminating power in sperm candles . .	15·4
Yield of coke per ton of good quality . .	13¾ cwts.

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PLUTONIC CEMENT
For Repairing and Jointing Gas-Retorts, and preventing porosity,
Manufactured only by
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NEAR SHEFFIELD,
STRONGLY RECOMMEND A TRIAL OF THEIR
CELEBRATED SILKSTONE GAS NUTS.

Analysis by F. J. EVANS, Esq., Chartered Gas Company, Horseferry Road, Westminster:—

(COPY.)

	Cubic Feet of Gas per Ton of Coal.	Illuminating Power in Candles.	Coke per Ton of Coal used.	Ash in Coke, per Cent.	Sulphur in Coal, per Cent.
Silkstone Nuts . . .	10·800	15·85	12·66 cwt.....	6·0	0·69

NOTE.—The illuminating power of the gas was tested by the standard burner now used in London by the Gas Referees, under the City of London Gas Act, 1868.

Horseferry Road, Westminster, March, 1870. (Signed) F. J. EVANS.

These Nuts are extensively used by various Gas Companies throughout the Kingdom, who bear strong testimony to their value.

APPLICATIONS FOR PRICES, &c., TO BE SENT DIRECT TO THE COLLIERY, AS ABOVE.

GAS PURIFICATION & CHEMICAL Co., LIMITED,

(Successors to JOHN WILLIAM O'NEILL & CO.,)

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The superiority of the material supplied by this Company is generally recognized, and it is now in use in nearly all the London and most of the large Provincial Gas-Works.

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THE DERBYSHIRE

SILKSTONE COAL COMPANY, LIMITED,

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GAS COAL

Of superior quality, delivered at any station in England and Wales.

Purified gas per ton of coal in cubic feet (average)	10,775
Weight of coke in lbs. per ton of coal	1,465

ANALYSIS AND PRICES ON APPLICATION TO

Mr. EDMUND TAYLOR, Secretary,

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THE LOCHORE AND CAPLEDRAE CANNEL COAL COMPANY, LIMITED.

Works: LOCHORE by LOCHGELLY, FIFESHIRE. Office: CUSTOM HOUSE CHAMBERS, LEITH.

This Company request attention to the very superior quality of their Cannel Coals.

1. The following are the practical results given by Dr. Wallace, of Glasgow, of analyses of their Lochore and Capledrae Cannels:—

	Sample worked at Capledrae.		Sample worked at Lochore
Gas per ton of coal, at 60° Fahr. and 30 inches barometric pressure . .	13,095 cubic feet.	..	11,760 cubic feet.
Illuminating power, in standard sperm candles, by union jet consuming 5 cubic feet per hour, at ·5-inch pressure	32·91	..	34·83
Value of 1 cubic foot of gas in grains of sperm	780	..	836
Equivalent of a ton of coal in pounds of sperm candles	1,459	..	1,404
Durability of 1 cubic foot by 5-inch flame	69 minutes.	..	71 minutes.
Gravity of the gas (air = 1000)	596	..	594

Remarks.—This (the sample from Capledrae) is a Cannel Coal of first-class quality, giving 13,000 feet of 33-candle gas. It contains only a minute proportion of sulphur, and the ash is almost quite white. The coke is of rather inferior quality.

Remarks on Sample from Lochore.—This is a Cannel Coal of first-class quality, giving a large yield of very rich gas and a coke of medium quality.

2. The following are the practical results of analyses by Dr. Wallace of the Company's Waverley Cannels:—

	Capledrae Waverley.		Lochore Waverley.
Gas per ton of coal, at 60° Fahr. and 30 inches barometer	9,120 cubic feet.	..	11,145 cubic feet.
Illuminating power, in standard candles, by union jet consuming 5 cubic feet per hour, at ·5-inch pressure	36·62	..	33·09
Value of 1 cubic foot of gas in grains of sperm	878	..	794
Equivalent of a ton of coal in pounds of sperm candles	1,145	..	1,264
Durability of 1 cubic foot of gas by 5-inch flame	80 minutes.	..	67 minutes.
Gravity of the gas (air = 1000)	677	..	597

Remarks on the Sample of Capledrae Waverley.—This Coal gives fully 9000 feet of gas of 36½ candles, and is admirably adapted for bringing up the quality of gas made from common coal or inferior qualities of cannel. The tests were made at a rather high temperature, this being one of the coals that stand a very high heat without serious diminution of the illuminating power of the gas The coke contains 60 per cent. of ash, and is therefore almost valueless, but the proportion of sulphur is very moderate.

Remarks on the Lochore Waverley.—This is a first-class Cannel Coal, giving 11,000 cubic feet of 33-candle gas. The quantity of sulphur is very minute, and the ash is nearly white. The coke is of inferior quality, but not wholly valueless.

Applications for full Copies of Analyses and Prices may be made to the Company.

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London: Printed by WILLIAM BOUGHTON KING (at the office of Clayton and Co., 17, Bouverie Street, Fleet Street); and published by him at No. 11, Bolt Court, Fleet Street, in the City of London.—Tuesday, March 21, 1876.